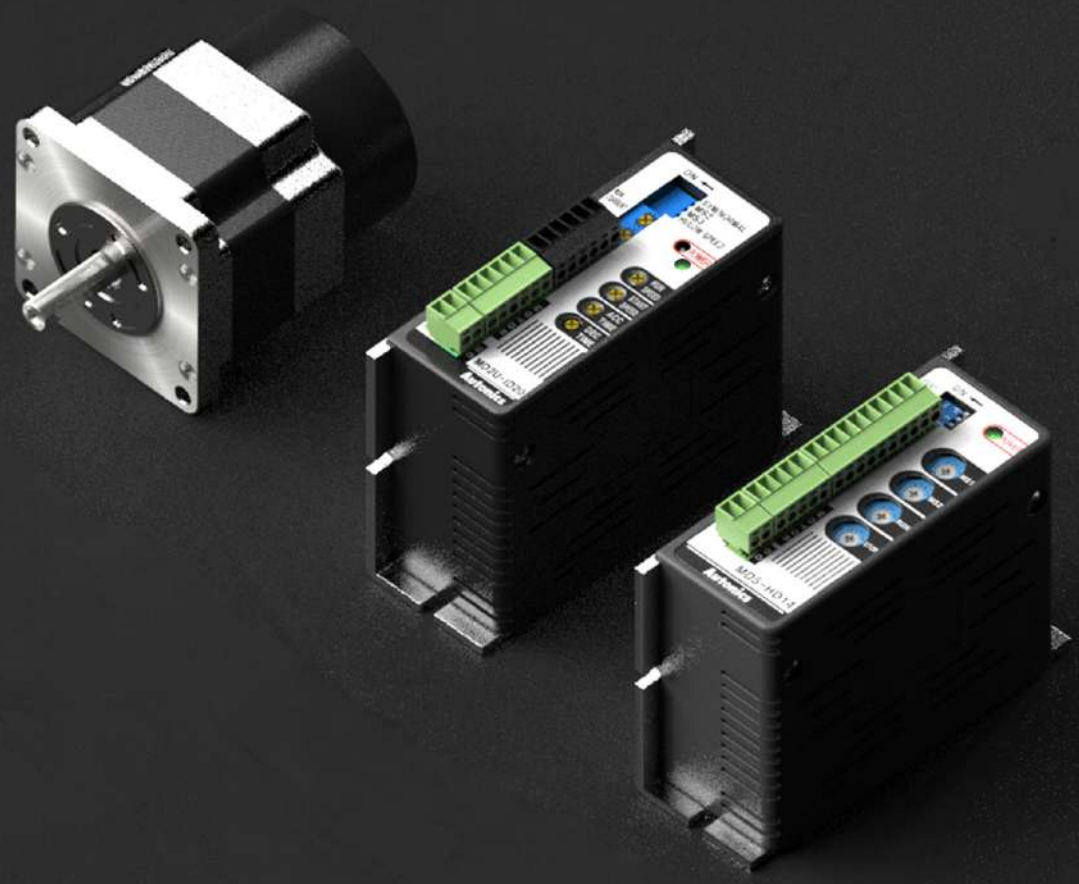
G. Motion Devices

Motion devices are used to convert electrical energy into mechanical energy acting as actuators in automation processes.




Autonics
CN1
CN2
CN3
CN4
Autonics


Autonics
AiCA EtherCAT
PWR/AL
INP
SERVO
ERR
RUN
CN1
ECAT
USB
CN3
ECAT OUT
ECAT IN
CN2
SOURCE
200-240VAC~
50/60Hz
ECAT ID
X10
X1
RG1
RG2
NC
L
N
PE
CN4
Ai-SERVO
AiCA-D.

G1. 2-Phase Closed-Loop Stepper Motor System

Closed-loop stepper motor systems consist of motors with integrated encoders for feedback and higher precision control.

G1-1	Closed-Loop Stepper Motor System	AiS Series	2-Phase Closed-Loop Stepper Motor System
		AiSA Series	AC Power Input 2-Phase Closed-Loop Stepper Motor System
		AiC Series	2-Phase Closed-Loop Stepper Motor Drivers with Integrated Controller
		AiC-CL Series	CC-Link Comm. Type 2-Phase Closed-Loop Stepper Motor System
		AiC-EC Series	EtherCAT Comm. Type 2-Phase Closed-Loop Stepper Motor System
		AiCA Series	AC Power Input 2-Phase Closed-Loop Stepper Motor System
		AiCA-EC Series	AC Power Input EtherCAT Comm. Type 2-Phase Closed-Loop Stepper Motor System
	Closed-Loop Stepper Motor System (Motor)	Ai-M / Ai-M-B Series	Standard / Built-In Brake Type 2-Phase Closed-Loop Stepper Motor
		Ai-M Series	Standard Type 2-Phase Closed-Loop Stepper Motor
		Ai-M-G / Ai-M-R Series	Built-In Gear / Rotary Actuator Type 2-Phase Closed-Loop Stepper Motor
		AiA-M / AiA-M-B Series	Standard / Built-In Brake Type AC Power Input 2-Phase Closed-Loop Stepper Motor
		AiA-M-G / AiA-M-R Series	Built-In Gear / Rotary Actuator Type AC Power Input 2-Phase Closed-Loop Stepper Motor

2-Phase Closed-Loop Stepper Motor System

AiS Series

Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Easy operation setting with external adjuster (Gain, Speed filter, In-position, Resolution)
- Built-in brake type motors available (AiS-D-B Series)

[Supported Motor*]

- Standard type: 20, 28, 35, 42, 56, 60 mm
- Built-in brake type: 42, 56, 60 mm
- Built-in gear type: 42, 60 mm
- Built-in rotary actuator type : 60 mm

Specifications

[Supported Driver]

Model	AiS-D-20□A	AiS-D-28□B	AiS-D-35□B
Power supply	24 VDC⎓ ±10%		
Max. RUN power 01)	≤ 50 W	≤ 60 W	
Stop power 02)	≤ 10 W		
Max. RUN current 03)	0.6 A / Phase	1.0 A / Phase	1.2 A / Phase
Stop current	25% or 50% (factory default: 50%) of max. RUN current		
Resolution	500 (factory default), 1000, 1600, 2000, 3600, 4000, 5000, 6400, 7200, 10000 PPR	500 (factory default), 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000, 16000 PPR	

Model	AiS-D-42□A-□	AiS-D-56□A-□	AiS-D-60□A-□
Power supply	24 VDC⎓ ±10%		
Max. RUN power 01)	≤ 60 W	≤ 120 W	≤ 240 W
Stop power 02)	S: ≤ 7 W (≤ 16 W) M: ≤ 7.5 W (≤ 16 W) L: ≤ 8 W (≤ 17 W)	S: ≤ 9.5 W (≤ 23 W) M: ≤ 10 W (≤ 23 W) L: ≤ 11 W (≤ 25 W)	S: ≤ 12 W (≤ 25 W) M: ≤ 13 W (≤ 26 W) L: ≤ 14 W (≤ 26 W)
Max. RUN current 03)	1.7 A / Phase	3.5 A / Phase	
Stop current	25% or 50% (factory default: 50%) of max. RUN current		
Resolution	500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR		

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.
02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%. The value in the bracket indicates built-in brake type.
03) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	(P Gain, I Gain)=(1, 1), (2, 1), (3, 1), (4, 1), (5, 1), (1, 2), (2, 2), (3, 2), (4, 2), (5, 2), (1, 3), (2, 3), (3, 3), (4, 3), (5, 3)
Max. rotation speed	3000 rpm
In-Position	Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7
Rotation direction	CW (factory default), CCW
Input	CW/CCW (RUN pulse), Servo ON/OFF, Alarm Reset (Photocoupler input)
Output	In-Position, Alarm Out (Photocoupler output), Encoder Signal (A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$, Line driver output), Brake (at supplying: 0.2 sec 24 VDC⎓, normal status: 11.5 VDC⎓ ±10%)
Pulse input method	1 pulse, 2 pulse (factory default)
Pulse input voltage	CW, CCW-[H]: 4 - 8 VDC⎓, [L]: 0 - 0.5 VDC⎓, Servo ON/OFF, Alarm Reset-[H]: 24 VDC⎓, [L]: 0 - 0.5 VDC⎓
Max. input pulse frequency	□ 20 / 28 / 35 mm: CW, CCW: 800 kHz □ 42 / 56 / 60 mm: CW, CCW: 500 kHz
Pulse width	CW, CCW: Input Pulse Frequency Duty 50% (□ 20 mm: ≥ 2 μs, □ 28 / 35 mm: ≥ 1.25 μs) Servo ON/OFF: ≥ 1 ms Alarm Reset: ≥ 20 ms
Rise fall time	CW, CCW: < 0.5 μs

View product detail

Input resistance	220 Ω (CW, CCW), 10 kΩ (Servo ON/OFF, Alarm Reset)
Insulation resistance	≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	1,000 VAC～ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s^2 (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	☐ 20 / 28 / 35 mm: 0 to 50°C, storage: -20 to 70°C (no freezing or condensation) ☐ 42 / 56 / 60 mm: 0 to 50°C, storage: -10 to 60°C (no freezing or condensation) Built-in brake type: 0 to 50°C, storage: -20 to 70°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Approval	CE EAC
Unit weight (packaged)	≈ 290 g (≈ 400 g)

AC Power Input

2-Phase Closed-Loop Stepper Motor System

AiSA Series

Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Supports 200 - 240 VAC～ AC power
- Easy operation setting with external adjuster (Gain, Speed filter, In-position, Resolution)
- 7 segment display for alarm / status reading
- Supports torque mode
- Supports Auto Current Down mode
- Built-in brake type motors available (AiSA-D-B Series)

[Supported Motor*]

- Standard type: 60, 86 mm
- Built-in brake type: 60, 86 mm
- Built-in gear type: 60, 86 mm
- Built-in rotary actuator type : 60 mm

View product detail

Specifications

[Supported Driver]

Model		AiSA-D-60MA-□	AiSA-D-60LA-□	AiSA-D-86MA-□	AiSA-D-86LA-□
Main	Power supply	200 - 240 VAC～ 50 / 60 Hz			
	Max. RUN power 01)	≤ 800 VA			
	Stop power 02)	≤ 60 VA		≤ 65 VA	≤ 70 VA
AUX 03)	Power supply	24 VDC⎓			
	Input current	0.3 A		0.5 A	
Max. RUN current 04)		2.0 A / Phase			
Stop current		20% to 100% of max. RUN current			
Resolution		500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR			

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.
02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%
03) Auxiliary power is only available in built-in brake type and not available in standard type.
04) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable (factory default), 2, 4, 6, 8, 10, 20, 40, 60, 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	Standard Gain: 0 to F, Inertia Gain: 0 to F
Max. rotation speed	3000 rpm
In-Position	Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7
Rotation direction	CW (factory default), CCW
Operation mode	Standard mode, Torque mode
Input	CW/CCW (RUN pulse), Servo ON/OFF, Alarm Reset (Photocoupler input)
Output	In-Position, Alarm Out (Photocoupler output), Encoder Signal (A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$, Line driver output)
Pulse input method	1 pulse, 2 pulse (factory default)
Pulse input voltage	CW, CCW-[H]: 4 - 8 VDC⎓, [L]: 0 - 0.5 VDC⎓, Servo ON/OFF, Alarm Reset-[H]: 24 VDC⎓, [L]: 0 - 0.5 VDC⎓
Max. input pulse frequency	CW, CCW: 500 kHz
Pulse width	CW, CCW: Input pulse frequency duty 50% Servo ON/OFF: ≥ 1 ms Alarm Reset: ≥ 10 ms
Rise fall time	CW, CCW: < 0.5 μs
Input resistance	4.7 kΩ (Anode Pull-Up)
Insulation resistance	≥ 200 MΩ (500 VDC⎓ megger)
Dielectric strength	1,500 VAC～ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s^2 (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Approval	CE RoHS EAC
Unit weight (packaged)	≈ 780 g (≈ 1,020 g)

2-Phase Closed-Loop Stepper Motor System

with Integrated Controller

AiC Series

Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Motor driver+Controller integrated type
- Control up to 31 axes with RS-485 communication
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 4 operation mode: Jog mode, Continuous mode, Index mode, Program Mode
- Built-in brake type motors available (AiC-D-B Series)

[Supported Motor*]

- Standard type: 20, 28, 35, 42, 56, 60 mm
- Built-in brake type: 42, 56, 60 mm
- Built-in gear type: 42, 60 mm
- Built-in rotary actuator type : 60 mm

View product detail

Specifications

[Supported Driver]

Model	AiC-D-20□A	AiC-D-28□B	AiC-D-35□B
Power supply	24 VDC⎓ ±10%		
Max. RUN power 01)	≤ 60 W		
Stop power 02)	≤ 10 W		
Max. RUN current 03)	0.6 A / Phase	1.0 A / Phase	1.2 A / Phase
Stop current	20 to 100% of max. RUN current (factory default: 50%)		
Resolution	500 (factory default), 1000, 1600, 2000, 3600, 4000, 5000, 6400, 7200, 10000 PPR	500 (factory default), 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000, 16000 PPR	

Model	AiC-D-42□A-□	AiC-D-56□A-□	AiC-D-60□A-□
Power supply	24 VDC⎓ ±10%		
Max. RUN power 01)	≤ 60 W	≤ 120 W	≤ 240 W
Stop power 02)	≤ 10 W	≤ 12 W	≤ 15 W
Max. RUN current 03)	1.7 A / Phase	3.5 A / Phase	
Stop current	20 to 100% of max. RUN current (factory default: 50%)		
Resolution	500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR		

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.
02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%
03) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	0 (factory default) ~ 14, FIne Gain
Max. rotation speed	3000 rpm
Positioning range	-2,147,483,648 to +2,147,483,647
In-Position	Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7
Rotation direction	CW (factory default), CCW
Operation mode	Jog mode, Continuous mode, Index mode, Program mode
Home search mode	General mode, Limit mode, Zero point mode, Torque mode
Index step	64 step
Program step	256 step
Program function	Power On Program Start, Power On Home Search
Control command	ABS, INC, HOM, ICJ, IRD, OPC, OPT, JMP, REP, RPE, END, POS, TIM, CMP
I/O voltage level	[H]: 5 - 30 VDC⎓, [L]: 0 - 2 VDC⎓
Input 01)	Exclusive input: 20, General input: 9
Output	Standard type - Exclusive output: 4, General output: 10 Built-in brake type - Exclusive output: 6, Generaloutput: 9
External power supply	VEX (recommended: 24 VDC⎓): 2, GEX (GND): 2
Insulation resistance	≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	1,000 VAC～ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s^2 (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Approval	CE EAC
Unit weight (packaged)	≈ 300 g (≈ 460 g)
Comm. protocol	Modbus RTU

01) Brake ON/OFF function can be changed from general input IN8 in case of built-in brake type.

CC-Link Comm. Type

2-Phase Closed-Loop Stepper Motor System

AiC-CL Series

Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Multi-axis simultaneous control with CC-Link communication
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 7 segment display for alarm / status reading
- Built-in brake type motors available (AiC-D-B-CL Series)

[Supported Motor*]

- Standard type: 20, 28, 35, 42, 56, 60 mm
- Built-in brake type: 42, 56, 60 mm
- Built-in gear type: 42, 60 mm
- Built-in rotary actuator type : 60 mm

View product detail

Specifications

[Supported Driver]

Model	AiC-D-20□A-CL	AiC-D-28□B-CL	AiC-D-35□B-CL
Power supply	24 VDC⎓ ±10%		
Max. RUN power 01)	≤ 60 W		
Stop power 02)	≤ 10 W		
Max. RUN current 03)	0.6 A / Phase	1.0 A / Phase	1.2 A / Phase
Stop current	20 to 100% of max. RUN current (factory default: 50%)		
Resolution	500 (factory default), 1000, 1600, 2000, 3600, 4000, 5000, 6400, 7200, 10000 PPR	500 (factory default), 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000, 16000 PPR	

Model	AiC-D-42□A-□-CL	AiC-D-56□A-□-CL	AiC-D-60□A-□-CL
Power supply	24 VDC⎓ ±10%		
Max. RUN power 01)	≤ 60 W	≤ 120 W	≤ 240 W
Stop power 02)	≤ 10 W	≤ 12 W	≤ 15 W
Max. RUN current 03)	1.7 A / Phase	3.5 A / Phase	
Stop current	20 to 100% of max. RUN current (factory default: 50%)		
Resolution	500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR		

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.
02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%
03) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	0 (factory default) to 14, Fine Gain
Max. rotation speed	3000 rpm
Positioning range	-2,147,483,648 to +2,147,483,647
In-Position	Fast response: 0 (factory default) to 7, Accurate response: 0 to 7
Rotation direction	CW (factory default), CCW
Operation mode	Jog mode, Continuous mode, Index mode, Program mode
Home search mode	General mode, Limit mode, Zero point mode, Torque mode
Index steps	64 step
Program steps	256 step
Program function	Power On Program Start, Power On Home Search
Control command	ABS, INC, HOM, ICJ, IRD, OPC, OPT, JMP, REP, RPE, END, POS, TIM
I/O voltage level	[H]: 5 - 30 VDC⎓, [L]: 0 - 2 VDC⎓
Input	Exclusive input: 3, General input: 8
Output	General output: 7
External power supply	VEX (recommended: 24 VDC⎓), GEX (GND)
Insulation resistance	≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	1,000 VAC∼ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s^2 (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Approval	CE
Unit weight (packaged)	≈ 320 g (≈ 470 g)
Comm. protocol	CC-Link Ver.1.10, Modbus RTU

EtherCAT Comm. Type

2-Phase Closed-Loop Stepper Motor System

AiC-EC Series

Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Multi-axis simultaneous control with EtherCAT communication
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 7-segment display for alarm / status reading
- Built-in brake type motors available (AiC-D-B-EC Series)

[Supported Motor*]

- Standard type: 20, 28, 35, 42, 56, 60 mm
- Built-in brake type: 42, 56, 60 mm
- Built-in gear type: 42, 60 mm
- Built-in rotary actuator type : 60 mm

Specifications

[Supported Driver]

Model	AiC-D-20□A-EC	AiC-D-28□B-EC	AiC-D-35□B-EC
Power supply	24 VDC⎓ ±10%		
Max. RUN power 01)	≤ 60 W		
Stop power 02)	≤ 10 W		
Max. RUN current 03)	0.6 A / Phase	1.0 A / Phase	1.2 A / Phase
Stop current	20 to 100% of max. RUN current		
Basic step angle	1.8° / Phase		
Resolution	500, 1000, 1600, 2000, 3600, 4000, 5000, 6400, 7200, 10000 (factory default) PPR	500, 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000 (factory default), 16000 PPR	

Model	AiC-D-42□A-□-EC	AiC-D-56□A-□-EC	AiC-D-60□A-□-EC
Power supply	24 VDC⎓ ±10%		
Max. RUN power 01)	≤ 60 W	≤ 120 W	≤ 240 W
Stop power 02)	≤ 10 W	≤ 12 W	≤ 15 W
Max. RUN current 03)	1.7 A / Phase	3.5 A / Phase	
Stop current	20 to 100% of max. RUN current		
Basic step angle	1.8° / Phase		
Resolution	500, 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 (factory default) PPR		

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.
02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%
03) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	0 (factory default) to 15, (15: Fine Gain)
Max. rotation speed	3,000 rpm
In-Position	Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7
Operation mode	CSP, CSV, PP, PV, HM
Home search	Homing on the negative limit switch and index pulse Homing on the positive limit switch and index pulse Homing on the home switch and index pulse (Positive) Homing on the home switch and index pulse (Negative) Homing without an index pulse (negative limit switch) Homing without an index pulse (positive limit switch) Homing without an index pulse (Positive and Home sensor ON) Homing without an index pulse (Negative and Home sensor ON) Homing on the index pulse (Negative) Homing on the index pulse (Positive) Set the Origin with Home offset Set the Origin and Reset Current Position Torque Homing Search- with Home offset Torque Homing Search+ with Home offset

View product detail

Next Page ▶

I/O voltage level	[H]: 5 - 30 VDC⎓, [L]: 0 - 2 VDC⎓
Input	Exclusive input: 7, General input: 5
Output	Exclusive output: 2, General output: 4
External power supply	VEX (Default: 24 VDC⎓), GEX (GND)
Insulation resistance	≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	1,000 VAC~ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s^2 (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Approval	CE KC RoHS
Unit weight (packaged)	≈ 350 g (≈ 500 g)
Comm. protocol	EtherCAT

AC Power Input

2-Phase Closed-Loop Stepper Motor System

AiCA Series

Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Supports 200 - 240 VAC～ AC power
- Motor driver+Controller integrated type
- Control up to 31 axes with RS-485 communication
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 4 operation mode: Jog mode, Continuous mode, Index mode, Program Mode
- 7 segment display for alarm / status reading
- Supports torque mode
- Supports Auto Current Down mode
- Built-in brake type motors available (AiCA-D-B Series)

[Supported Motor*]

- Standard type: 60, 86 mm
- Built-in brake type: 60, 86 mm
- Built-in gear type: 60, 86 mm
- Built-in rotary actuator type : 60 mm

View product detail

Specifications

[Supported Driver]

Model		AiCA-D-60MA-□	AiCA-D-60LA-□	AiCA-D-86MA-□	AiCA-D-86LA-□
Main	Power supply	200 - 240 VAC～ 50 / 60 Hz			
	Max. RUN power 01)	≤ 800 VA			
	Stop power 02)	≤ 60 VA		≤ 65 VA	
AUX 03)	Power supply	24 VDC⎓			
	Input current	0.3 A		0.5 A	
Max. RUN current 04)		2.0 A / Phase			
Stop current		20 to 100% of max. RUN current			
Resolution		500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR			

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.
02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%
03) Auxiliary power is only available in built-in brake type and not available in standard type.
04) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	0 (factory default) to 30, Fine Gain
Max. rotation speed	3000 rpm
Position setting range	-2,147,483,648 to +2,147,483,647
In-Position	Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7
Rotation direction	CW (factory default), CCW
Operation mode	Jog mode, Continuous mode, Index mode, Program mode
Home search mode	General mode, Limit mode, Zero point mode, Torque mode
Index step	64 step
Program step	256 step
Program function	Power On Program Start, Power On Home Search
Control command	ABS, INC, HOM, ICJ, IRD, OPC, OPT, JMP, REP, RPE, END, POS, TIM, CMP, TOQ
I/O voltage level	[H]: 5 - 30 VDC⎓, [L]: 0 - 2 VDC⎓
Input 01)	Exclusive input: 20, General input: 9
Output	Exclusive output: 4, General output: 10
External power supply	VEX (24 VDC⎓ fixed): 2, GEX (GND): 2
Input resistance	4.7 kΩ (Anode Pull-up)
Insulation resistance	≥ 200 MΩ (500 VDC⎓ megger)
Dielectric strength	1,500 VAC～ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s^2 (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Approval	CE RoHS EAC
Unit weight (packaged)	≈ 780 g (≈ 1,050 g)
Comm. protocol	Modbus RTU

01) Brake ON/OFF function can be changed from general input IN8 in case of built-in brake type.

AC Power Input
EtherCAT Comm. Type
2-Phase Closed-Loop Stepper Motor System

AiCA-EC Series

Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Supports 200 - 240 VAC～ AC power
- Multi-axis simultaneous control with EtherCAT communication
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 7-segment display for alarm / status reading
- Supports torque mode
- Supports Auto Current Down mode
- Built-in brake type motors available (AiCA-D-B-EC Series)
- Built-in geared / rotary actuator type motors available

[Supported Motor*]
- Standard type: 60, 86 mm
- Built-in brake type: 60, 86 mm
- Built-in gear type: 60, 86 mm
- Built-in rotary actuator type : 60 mm

View product detail

Specifications

[Supported Driver]

Model		AiCA-D-60MA-□-EC	AiCA-D-60LA-□-EC	AiCA-D-86MA-□-EC	AiCA-D-86LA-□-EC
Main power	Power supply	200 - 240 VAC～ 50/60 Hz			
	Max. RUN power 01)	≤ 800 VA			
	Stop power 02)	≤ 60 VA		≤ 65 VA	
AUX power 03)	Power supply	24 VDC⎓			
	Input current	0.3 A		0.5 A	
Max. RUN current 04)		2.0 A / Phase			
Stop current		20 to 100% of max. RUN current			
Resolution		500, 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 (factory default) PPR			

01) When changing the load rapidly, instantaneous peak current may increase.
The capacity of power supply should be over 1.5 to 2 times of max. RUN power.
02) Based on ambient temp. 25 °C, ambient humi. 55 %RH, stop current 20%
03) Auxiliary power is only available in built-in brake type and not available in standard type.
04) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60(factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	0 (factory default) to 31, (31: Fine Gain)
Max. rotation speed	3,000 rpm
In-Position	Fast Response: 0 to 7 (factory default), Accurate Response: 0 to 7
Operation mode	CSP, CSV, CST, PP, PV, HM
Home search	Homing on the negative limit switch and index pulse Homing on the positive limit switch and index pulse Homing on the home switch and index pulse (Positive) Homing on the home switch and index pulse (Negative) Homing without an index pulse (negative limit switch) Homing without an index pulse (positive limit switch) Homing without an index pulse (Positive and Home sensor ON) Homing without an index pulse (Negative and Home sensor ON) Homing on the index pulse (Negative) Homing on the index pulse (Positive) Set the Origin with Home offset Set the Origin and Reset Current Position Torque Homing Search- with Home offset Torque Homing Search+ with Home offset
Input	Exclusive input: 7, General input: 5
Output	Exclusive output: 2 General output: 4
External power supply	VEX (Default: 24 VDC⎓), GEX (GND)
Input resistance	4.7 kΩ (Anode Pull-Up)
Insulation resistance	≥ 200 MΩ (500 VDC⎓ megger)
Dielectric strength	1,500 VAC～ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s^2 (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Approval	CE KC RoHS
Unit weight (packaged)	≈ 770 g (≈ 1,040 g)
Comm. protocol	EtherCAT

Standard / Built-In Brake Type

2-Phase Closed-Loop Stepper Motor

Ai-M / Ai-M-B Series

Features

- Supports ☐ 42 mm, ☐ 56 mm, ☐ 60 mm
- Non-excitation electromagnetic built-in brake type motor (Ai-M-B Series)

Specifications

Model	Ai-M-42SA-☐	Ai-M-42MA-☐	Ai-M-42LA-☐
Max. stop torque	0.25 N m	0.4 N m	0.48 N m
Rotor inertia moment	35×10^{-7} kg · m²	54×10^{-7} kg · m²	77×10^{-7} kg · m²
Rated current	1.7 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	1.7 Ω / Phase ±10%	1.85 Ω / Phase ±10%	2.1 Ω / Phase ±10%
Inductance	1.9 mH / Phase ±20%	3.5 mH / Phase ±20%	4.4 mH / Phase ±20%
Unit weight (packaged) 01)	≈ 0.34 kg (≈ 0.45 kg)	≈ 0.41 kg (≈ 0.52 kg)	≈ 0.48 kg (≈ 0.59 kg)
	≈ 0.67 kg (≈ 0.77 kg)	≈ 0.73 kg (≈ 0.83 kg)	≈ 0.80 kg (≈ 0.90 kg)

Model	Ai-M-56SA-☐	Ai-M-56MA-☐	Ai-M-56LA-☐
Max. stop torque	0.6 N m	1.2 N m	2.0 N m
Rotor inertia moment	140×10^{-7} kg · m²	280×10^{-7} kg · m²	480×10^{-7} kg · m²
Rated current	3.5 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	0.55 Ω / Phase ±10%	0.57 Ω / Phase ±10%	0.93 Ω / Phase ±10%
Inductance	1.05 mH / Phase ±20%	1.8 mH / Phase ±20%	3.7 mH / Phase ±20%
Unit weight (packaged) 01)	≈ 0.62 kg (≈ 0.76 kg)	≈ 0.85 kg (≈ 0.99 kg)	≈ 1.22 kg (≈ 1.36 kg)
	≈ 1.15 kg (≈ 1.30 kg)	≈ 1.38 kg (≈ 1.52 kg)	≈ 1.75 kg (≈ 1.90 kg)

Model	Ai-M-60SA-☐	Ai-M-60MA-☐	Ai-M-60LA-☐
Max. stop torque	1.1 N m	2.2 N m	2.9 N m
Rotor inertia moment	240×10^{-7} kg · m²	490×10^{-7} kg · m²	690×10^{-7} kg · m²
Rated current	3.5 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	1.0 Ω / Phase ±10%	1.23 Ω / Phase ±10%	1.3 Ω / Phase ±10%
Inductance	1.5 mH / Phase ±20%	2.6 mH / Phase ±20%	3.8 mH / Phase ±20%
Unit weight (packaged) 01)	≈ 0.75 kg (≈ 0.89 kg)	≈ 1.13 kg (≈ 1.27 kg)	≈ 1.44 kg (≈ 1.58 kg)
	≈ 1.36 kg (≈ 1.53 kg)	≈ 1.74 kg (≈ 1.90 kg)	≈ 2.07 kg (≈ 2.23 kg)

01) Listed in order of Standard type / Built-in brake type

Motor phase	2-phase
RUN method	Bipolar
Insulation class	B type (130°C)
Insulation resistance	Between motor coil and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	Between motor coil and case: 500 VAC~ 50 / 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	≲ 50 G
Ambient temp.	0 to 50°C, storage: -20 to 70°C (no freezing or condensation)
Ambient humi.	20 to 85%RH, storage: 15 to 90%RH (no freezing or condensation)
Protection rating	IP30 (IEC34-5 standard)
Approval	CE EAC
Stop angle error	± 0.09° (Full step, no load)
Shaft vibration	0.03 mm T.I.R.
Radial movement 01)	≤ 0.025 mm T.I.R.
Axial movement 02)	≤ 0.01 mm T.I.R.
Shaft concentricity	0.05 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) Amount of radial shaft displacement when applying radial load (25 N) to the end of the shaft.
02) Amount of axial shaft displacement when applying axial load (50 N) to the motor shaft.

Next Page ▶

View product detail

Standard Type

Built-in Brake Type

Encoder type	**Incremental rotary encoder**
Power supply	5 VDC⎓ ± 5% (ripple P-P: ≤ 5%)
Current consumption	≤ 50 mA (no load)
Resolution	10,000 PPR (2,500 PPR × 4)
Control output	Line driver output
Output phase	A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$
Output waveform	Output duty rate: $\frac{T}{2} \pm \frac{T}{4}$, A-B phase difference: $\frac{T}{4} \pm \frac{T}{8}$ (T = 1 cycle of A)
Inflow current	≤ 20 mA
Residual voltage	≤ 0.5 VDC⎓
Outflow current	≤ -20 mA
Output voltage	≥ 2.5 VDC⎓
Response speed	≤ 0.5 μs (based on cable length: 2 m, I sink = 20 mA)
Max. response freq.	300 kHz

Built-in brake type frame size	**□ 42 mm**	**□ 56 mm**	**□ 60 mm**
Rated excitation voltage 01)	24 VDC⎓ ±10%		
Rated excitation current	0.208 A	0.275 A	
Static friction torque	≥ 0.18 N m	≥ 0.8 N m	
Rotation part inertia moment	6×10^{-7} kg · m^2	19×10^{-7} kg · m^2	
Insulation class	B type (130°C)		
B type brake	Brake is released when power ON, brake is locked when power OFF		
Operating time	≤ 25 ms	≤ 30 ms	
Releasing time	≤ 10 ms	≤ 20 ms	

01) In order to reduce the heat generation of the built-in brake, the voltage drops from 24 VDC⎓ to 11.5 VDC⎓ to control.

Standard Type

2-Phase Closed-Loop Stepper Motor

Ai-M Series

Features

• Supports ☐ 20 mm, ☐ 28 mm, ☐ 35 mm

Specifications

Model	Ai-M-20MA	Ai-M-20LA
Max. stop torque	0.018 N m	0.035 N m
Rotor inertia moment	2×10^{-7} kg · m^2	
Rated current	0.6 A / Phase	
Basic step angle	1.8° / 0.9° (Full / Half step)	
Resistance	6.6 Ω / Phase ±10%	10.5 Ω / Phase ±10%
Inductance	2.1 mH / Phase ±20%	4.0 mH / Phase ±20%
Unit weight (packaged)	≈ 0.092 kg (≈ 0.192 kg)	≈ 0.120 kg (≈ 0.219 kg)

Model	Ai-M-28SB	Ai-M-28MB	Ai-M-28LB
Max. stop torque	0.05 N m	0.14 N m	0.16 N m
Rotor inertia moment	9×10^{-7} kg · m^2	12×10^{-7} kg · m^2	18×10^{-7} kg · m^2
Rated current	1.0 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	5.78 Ω / Phase ±10%	8.8 Ω / Phase ±10%	10.1 Ω / Phase ±10%
Inductance	3.2 mH / Phase ±20%	6.0 mH / Phase ±20%	6.2 mH / Phase ±20%
Unit weight (packaged)	≈ 0.162 kg (≈ 0.260 kg)	≈ 0.222 kg (≈ 0.318 kg)	≈ 0.248 kg (≈ 0.342 kg)

Model	Ai-M-35SB	Ai-M-35MB	Ai-M-35LB
Max. stop torque	0.07 N m	0.13 N m	0.31 N m
Rotor inertia moment	8×10^{-7} kg · m^2	14×10^{-7} kg · m^2	22×10^{-7} kg · m^2
Rated current	1.2 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	2.1 Ω / Phase ±10%	3.25 Ω / Phase ±10%	5.0 Ω / Phase ±10%
Inductance	1.25 mH / Phase ±20%	2.85 mH / Phase ±20%	5.6 mH / Phase ±20%
Unit weight (packaged)	≈ 0.180 kg (≈ 0.278 kg)	≈ 0.250 kg (≈ 0.347 kg)	≈ 0.366 kg (≈ 0.456 kg)

Motor phase	2-phase
Run method	Bipolar
Insulation class	B type (130°C)
Insulation resistance	Between motor coil and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	Between motor coil and case: 500 VAC∼ 50 / 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	≲ 50 G
Ambient temp.	0 to 50°C, storage: -20 to 70°C (no freezing or condensation)
Ambient humi.	20 to 85%RH, storage: 15 to 90%RH (no freezing or condensation)
Protection rating	IP30 (IEC34-5 standard)
Approval	CE EAC
Stop angle error	± 0.09° (Full step, no load)
Shaft vibration	0.03 mm T.I.R.
Radial movement 01)	≤ 0.025 mm T.I.R.
Axial movement 02)	≤ 0.005 mm T.I.R.
Shaft concentricity	0.05 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) Amount of radial shaft displacement when adding a radial load (450 g) to the top of the shaft.
02) Amount of radial shaft displacement when adding a axial load (920 g) to the shaft.

View product detail

Next Page ▶

Encoder type	Incremental Rotary Encoder		
Frame size	☐ 20 mm	☐ 28 mm	☐ 35 mm
Power supply	5 VDC⎓ ± 5% (ripple P-P: ≤ 5%)		
Current consumption	≤ 50 mA (No load)		
Resolution	4,000 PPR (1,000 PPR × 4)	16,000 PPR (4,000 PPR × 4)	
Control output	Line driver Output		
Output phase	A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$		
Output waveform	Output phase: $\frac{T}{2} \pm \frac{T}{3}$, A-B phase difference: $\frac{T}{4} \pm \frac{T}{4}$ (T = 1 cycle of A)		
Inflow current	≤ 20 mA		
Residual voltage	≤ 0.5 VDC⎓		
Outflow current	≤ -20 mA		
Output voltage	≥ 2.5 VDC⎓		
Response speed [01)]	≤ 1.5 μs	≤ 1 μs	
Max. response freq.	200 kHz	1,000 kHz	

01) Cable length: 2 m, I sink = 20 mA

Built-In Gear / Rotary Actuator Type

2-Phase Closed-Loop Stepper Motor

Ai-M-G / Ai-M-R Series

Features

- Built-in planetary gear type motor (Ai-M-G)
- Built-in rotary actuator type motor (Ai-M-R)
- Supports ☐ 42 mm, ☐ 60 mm

Specifications

Model	Ai-M-42MA-G5	Ai-M-42MA-G7.2	Ai-M-42MA-G10
Max. stop torque	1.5 N m	2 N m	2 N m
Rotor inertia moment	54×10^{-7} kg · m^2		
Rated current	1.7 A / Phase		
Allowable torque	1 N m	1.5 N m	1.5 N m
Standard step angle	0.36°	0.25°	0.18°
Backlash	35 min (0.58°)		
Resistance	1.85 Ω / Phase ±10%		
Inductance	3.5 mH / Phase ±20%		
Unit weight (packaged)	≈ 0.58 kg (≈ 0.70 kg)		

Model	Ai-M-60MA-☐5	Ai-M-60MA-☐7.2	Ai-M-60MA-☐10
Max. stop torque	7 N m	9 N m	11 N m
Rotor inertia moment	490×10^{-7} kg · m^2		
Rated current	3.5 A / Phase		
Allowable torque	5 N m	6 N m	7 N m
Standard step angle	0.36°	0.25°	0.18°
Backlash	35 min (0.58°)		
Resistance	1.23 Ω / Phase ±10%		
Inductance	2.6 mH / Phase ±20%		
Unit weight (packaged) 01)	≈ 1.52 kg (≈ 1.68 kg)		
	≈ 1.60 kg (≈ 1.76 kg)		

01) Listed in order of $\frac{\text{Built-in gear type}}{\text{Built-in rotary actuator type}}$

Motor phase	2-phase
Run method	Bipolar
Insulation class	B type (130°C)
Insulation resistance	Between motor coil and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	Between motor coil and case: 500 VAC～ 50 / 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	≲ 50 G
Ambient temp.	0 to 50°C, storage: -20 to 70°C (no freezing or condensation)
Ambient humi.	20 to 85%RH, storage: 15 to 90%RH (no freezing or condensation)
Protection rating	IP30 (IEC standard)
Approval	CE
Stop angle error	± 0.09° (Full step, no load)
Shaft vibration	0.03 mm T.I.R.
Radial Movement 01)	≤ 0.025 mm T.I.R.
Axial Movement 02)	≤ 0.01 mm T.I.R.
Shaft concentricity	0.05 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) Amount of radial shaft displacement when applying radial load (25 N) to the end of the motor shaft
02) Amount of axial shaft displacement when applying axial load (50 N) to the motor shaft

View product detail

Next Page ▶

Encoder type	Incremental Rotary Encoder
Power supply	5 VDC⎓ ± 5% (ripple P-P: ≤ 5%)
Current consumption	≤ 50 mA (no load)
Resolution	10,000 PPR (2,500 PPR × 4-multiply)
Control output	Line driver output
Output phase	A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$
Output waveform	Output duty rate: $\frac{T}{2} \pm \frac{T}{4}$, A-B phase difference $\frac{T}{4} \pm \frac{T}{8}$ (T = 1 cycle of A)
Inflow current	≤ 20 mA
Residual voltage	≤ 0.5 VDC⎓
Outflow current	≤ -20 mA
Output voltage	≥ 2.5 VDC⎓
Response speed	≤ 0.5 μs (based on cable length: 2 m, I sink = 20 mA)
Max. response frequency	300 kHz

Standard / Built-In Brake Type AC Power Input

2-Phase Closed-Loop Stepper Motor

AiA-M / AiA-M-B Series

Features

- Supports □ 60 mm, □ 86 mm
- Non-excitation electromagnetic built-in brake type Motor (AiA-M-B Series)

Specifications

Model	AiA-M-60MA-□	AiA-M-60LA-□
Max. stop torque	1.1 N m	2.2 N m
Rotor inertia moment	240×10^{-7} kg · m^2	490×10^{-7} kg · m^2
Rated current	2.0 A / Phase	
Basic step angle	1.8° / 0.9° (Full / Half step)	
Resistance	1.5 Ω / Phase ±10%	2.4 Ω / Phase ±10%
Inductance	3.9 mH / Phase ±20%	8.5 mH / Phase ±20%
Unit weight (packaged) 01)	≈ 0.75 kg (≈ 0.95 kg)	≈ 1.15 kg (≈ 1.35 kg)
	≈ 1.35 kg (≈ 1.53 kg)	≈ 1.75 kg (≈ 1.90 kg)

Model	AiA-M-86MA-□	AiA-M-86LA-□
Max. stop torque	2.8 N m	4.0 N m
Rotor inertia moment	$1{,}100\times10^{-7}$ kg · m^2	$1{,}800\times10^{-7}$ kg · m^2
Rated current	2.0 A / Phase	
Basic step angle	1.8° / 0.9° (Full / Half step)	
Resistance	2.3 Ω / Phase ±10%	1.9 Ω / Phase ±10%
Inductance	11.5 mH / Phase ±20%	16.2 mH / Phase ±20%
Unit weight (packaged) 01)	≈ 1.70 kg (≈ 2.00 kg)	≈ 2.30 kg (≈ 2.60 kg)
	≈ 2.50 kg (≈ 2.76 kg)	≈ 3.10 kg (≈ 3.36 kg)

01) Listed in order of $\frac{\text{Standard type}}{\text{Built-in brake type}}$

Motor phase	2-phase
Run method	Bipolar
Insulation class	B type (130°C)
Insulation resistance	Between motor coil and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	Between motor coil and case: 1,000 VAC～ 50 / 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	≲ 50 G
Ambient temp.	0 to 50°C, storage: -20 to 70°C (no freezing or condensation)
Ambient humi.	20 to 85%RH, storage: 15 to 90%RH (no freezing or condensation)
Protection rating	IP30 (IEC34-5 standard)
Approval	CE
Stop angle error	± 0.09° (Full step, no load)
Shaft vibration	0.03 mm T.I.R.
Radial movement 01)	≤ 0.025 mm T.I.R.
Axial movement 02)	≤ 0.01 mm T.I.R.
Shaft concentricity	0.05 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) Amount of radial shaft displacement when applying radial load (25 N) to the end of the shaft.
02) Amount of axial shaft displacement when applying axial load (50 N) to the shaft.

View product detail

Standard Type

Built-in Brake Type

Next Page ▶

Encoder type	**Incremental Rotary Encoder**
Power supply	5 VDC⎓ ± 5% (ripple P-P: ≤ 5%)
Current consumption	≤ 50 mA (No load)
Resolution	10,000 PPR (2,500 PPR × 4)
Control output	Line driver Output
Output phase	A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$
Output waveform	Output Duty rate: $\frac{T}{2} \pm \frac{T}{4}$, A-B phase difference: $\frac{T}{4} \pm \frac{T}{8}$ (T = 1 cycle of A)
Inflow current	≤ 20 mA
Residual voltage	≤ 0.5 VDC⎓
Outflow current	≤ -20 mA
Output voltage	≥ 2.5 VDC⎓
Response speed	≤ 0.5 μs (Cable length: 2 m, I sink = 20 mA)
Max. response freq.	300 kHz

Built-in brake type frame size	**□ 60 mm**	**□ 86 mm**
Rated excitation voltage	24 VDC⎓ ±10%	
Rated excitation current	0.275 A	0.479 A
Static friction torque	0.75 N m	2.6 N m
Rotation part inertia moment	1.9×10^{-6} kg · m^2	12×10^{-6} kg · m^2
Insulation class	B type (130°C)	
B type brake	Brake is released when power ON, brake is locked when power OFF	
Operating time	30 ms	40 ms
Releasing time	10 ms	25 ms

Built-In Gear / Rotary Actuator Type AC Power Input

2-Phase Closed-Loop Stepper Motor

AiA-M-G / AiA-M-R Series

Features

- Built-in planetary gear type motor (AiA-M-G)
- Built-in rotary actuator type motor (AiA-M-R)
- Supports ☐ 60 mm, ☐ 86 mm

Specifications

Model	AiA-M-60LA-☐5	AiA-MA-60LA-☐7.2	AiA-MA-60LA-☐10
Max. stop torque	7 N m	9 N m	11 N m
Rotor inertia moment	490×10^{-7} kg · m^2		
Rated current	2.0 A / Phase		
Allowable torque	5 N m	6 N m	7 N m
Standard step angle	0.36°	0.25°	0.18°
Backlash	35 min (0.58°)		
Resistance	2.4 Ω / Phase ±10%		
Inductance	8.5 mH / Phase ±20%		
Unit weight (packaged) 01)	≈ 1.54 kg (≈ 1.70 kg)		
	≈ 1.62 kg (≈ 1.78 kg)		

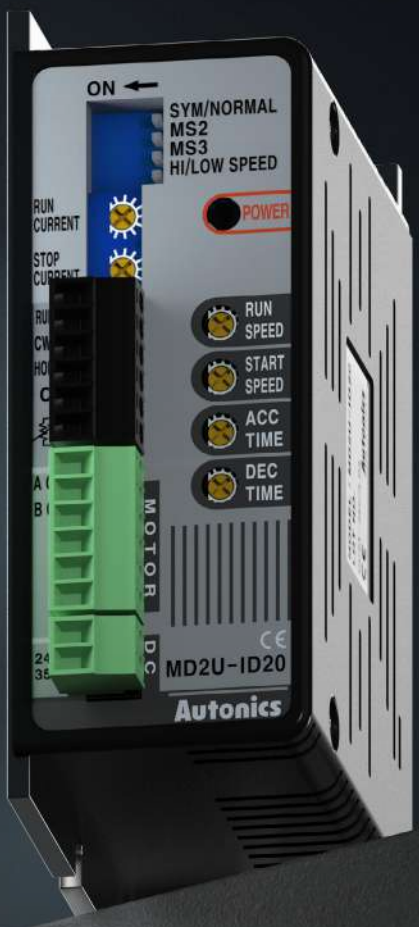
01) Listed in order of Built-in gear type / Built-in rotary actuator type

Model	AiA-M-86LA-G5	AiA-M-86LA-G7.2	AiA-M-86LA-G10
Max. stop torque	20 N m	28 N m	35 N m
Rotor inertia moment	1800×10^{-7} kg m^2		
Rated current	2.0 A / Phase		
Allowable torque	14 N m	20 N m	20 N m
Standard step angle	0.36°	0.25°	0.18°
Backlash	35 min (0.58°)		
Resistance	1.9 Ω / Phase ±10%		
Inductance	16.2 mH / Phase ±20%		
Unit weight (packaged)	≈ 3,700 kg (≈ 3,950 kg)		

Motor phase	2-phase
Run method	Bipolar
Insulation class	B type (130°C)
Insulation resistance	Between motor coil and case: ≥ 100 MΩ (500 VDC⎓ megger),
Dielectric strength	Between motor coil and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	≲ 50 G
Ambient temp.	0 to 50°C, storage: -20 to 70°C (no freezing or condensation)
Ambient humi.	20 to 85%RH, storage: 15 to 90%RH (no freezing or condensation)
Protection rating	IP30 (IEC standard)
Approval	CE
Stop angle error	± 0.09° (Full step, no load)
Shaft vibration	0.05 mm T.I.R.
Radial Movement 01)	≤ 0.025 mm T.I.R.
Axial Movement 02)	≤ 0.01 mm T.I.R.
Shaft concentricity	0.075 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) Amount of radial shaft displacement when applying radial load (25 N) to the end of the motor shaft
02) Amount of axial shaft displacement when applying axial load (50 N) to the motor shaft

View product detail



G2. 2-Phase Stepper Motor Drivers

Stepper motor drivers receive pulse signals from a controlling unit such as a motion controller and transmits electric currents to motors.

G2-1	2-Phase Stepper Motor Drivers	MD2U-ID20 Series	Intelligent Type 2-Phase Stepper Motor Drivers
		MD2U-MD20 Series	Micro Step 2-Phase Stepper Motor Drivers

Intelligent Type
2-Phase Stepper Motor Drivers

MD2U-ID20 Series

Features

- Unipolar constant current drive method
- STOP current setting provides holding torque (brake function)
- Isolated photocoupler input design minimizes influence from electrical noise
- Power supply Range: 24 - 35 VDC⎓

Specifications

Model	MD2U-ID20
Power supply 01)	24 - 35 VDC⎓ ± 10%
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current 02)	0.5 - 2 A / Phase
STOP current	20 to 70% of RUN current (set by STOP current setting rotary switch)
RUN method	Unipolar constant current drive
Standard step angle	1.8° / Step
Max. RUN speed	1500 rpm
Input resistance	3.3 kΩ (CW/CCW, RUN/STOP, HOLD OFF)
Insulation resistance	Between all terminal and case: ≥ 200 MΩ (500 VDC⎓ megger)
Dielectric strength	Between all terminal and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Noise immunity	± 500 VDC⎓ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Approval	CE EAC
Unit weight (packaged)	≈ 109 g (≈ 303 g)

01) If a power supply is over 30 VDC⎓, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area.
02) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.

View product detail

Micro Step
2-Phase Stepper Motor Drivers

MD2U-MD20 Series

Features

- Unipolar constant current drive method
- STOP current setting provides holding torque (brake function)
- Low vibration operation with micro stepping drive
- Isolated photocoupler input design minimizes influence from electrical noise
- Power supply Range: 24 - 35 VDC⎓

Specifications

Model	MD2U-MD20
Power supply [01]	24 - 35 VDC⎓ ± 10%
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current [02]	0.5 - 2 A / Phase
STOP current	20 to 70% of RUN current (set by stop current setting rotary switch)
RUN method	Unipolar constant current drive
Basic step angle	1.8° / Step
Resolution	1, 2, 4, 5, 8, 10, 16, 20 division (1.8° to 0.09° / Step)
Pulse width	≥ 10 μs (CW / CCW), 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 0.5 μs (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC⎓, [L]: 0 - 0.5 VDC⎓
Pulse input current	4 mA (CW / CCW), 10 mA (HOLD OFF)
Max. input pulse frequency	≤ 50 kHz (CW / CCW)
Input resistance	300 Ω (CW / CCW), 390 Ω (HOLD OFF)
Insulation resistance	Between all terminal and case: ≥ 200 MΩ (500 VDC⎓ megger)
Dielectric strength	Between all terminal and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Noise immunity	± 500 VDC⎓ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Approval	CE EAC
Unit weight (packaged)	≈ 180 g (≈ 295 g)

01) If a power supply is over 30 VDC⎓, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area. The torque may vary depending on power supply.
02) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.

View product detail

G3. 5-Phase Stepper Motor & Drivers

Stepper motors are electric motors which rotate by converting electric current from motor drivers into equally divided steps of a full rotation.

G3-1	5-Phase Stepper Motors	AK Series	Standard / Built-In Brake Type 5-Phase Stepper Motors (□ 24 / 42 / 60 / 85 mm)
		AHK Series	Hollow Shaft Type 5-Phase Stepper Motor (□ 42 / 60 / 85 mm)
		AK-G / AK-R Series	Built-In Gear / Rotary Actuator Type 5-Phase Stepper Motors (□ 42 / 60 / 85 mm)
G3-2	5-Phase Stepper Drivers	MD5-HD14 Series	Micro Step 5-Phase Stepper Motor Drivers
		MD5-HF14 Series	Micro Step 5-Phase Stepper Motor Drivers
		MD5-HF14-AO Series	Micro Step 5-Phase Stepper Motor Drivers
		MD5-HF28 Series	Micro Step 5-Phase Stepper Motor Drivers
		MD5-ND14 Series	Micro Step 5-Phase Stepper Motor Drivers
		MD5-HD14-2X / MD5-HD14-3X Series	Micro Step 5-Phase Stepper Motor Drivers

Standard / Built-In Brake Type

5-Phase Stepper Motors

(□ 24 / 42 / 60 / 85 mm)

AK Series

Features

- Compact and light weight with high accuracy, high speed and high torque
- Ideal for building compact sized system
- Low price for improved cost efficiency
- In pursuit of compact equipment applied with □ 42 mm, □ 60 mm, □ 85 mm built-in brake type (AK-B Series)
- Brake releases when power is applied on brake wire (AK-B Series)

Specifications

Model	02K-S523□	04K-S525□
Max. stop torque	0.18 kgf cm (0.018 N m)	0.28 kgf cm (0.028 N m)
Rotor inertia moment	4.2×10^{-7} kg · m^2	8.2×10^{-7} kg · m^2
Rated current	0.75 A / Phase	
Basic step angle	0.72° / 0.36° (Full / Half step)	
Unit weight (packaged)	≈ 0.08 kg (≈ 0.10 kg)	≈ 0.12 kg (≈ 0.16 kg)

Model	A1K-S543□-□	A2K-S544□-□	A3K-S545□-□
Max. stop torque	1.3 kgf cm (0.13 N m)	1.8 kgf cm (0.18 N m)	2.4 kgf cm (0.24 N m)
Rotor inertia moment	35×10^{-7} kg · m^2	54×10^{-7} kg · m^2	68×10^{-7} kg · m^2
Rated current	0.75 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged) 01)	≈ 0.25 kg (≈ 0.34 kg)	≈ 0.30 kg (≈ 0.39 kg)	≈ 0.40 kg (≈ 0.49 kg)
	≈ 0.39 kg (≈ 0.44 kg)	≈ 0.44 kg (≈ 0.49 kg)	≈ 0.54 kg (≈ 0.59 kg)

Model	A4K-□564□-□	A8K-□566□-□	A16K-□569□-□
Max. stop torque	4.2 kgf cm (0.42 N m)	8.3 kgf cm (0.83 N m)	16.6 kgf cm (1.66 N m)
Rotor inertia moment	175×10^{-7} kg · m^2	280×10^{-7} kg · m^2	560×10^{-7} kg · m^2
Rated current	S: 0.75 A / Phase M: 1.4 A / Phase G: 2.8 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged) 01)	≈ 0.60 kg (≈ 0.85 kg)	≈ 0.80 kg (≈ 1.05 kg)	≈ 1.30 kg (≈ 1.55 kg)
	≈ 0.95 kg (≈ 1.03 kg)	≈ 1.25 kg (≈ 1.33 kg)	≈ 1.65 kg (≈ 1.73 kg)

Model	A21K-□596□-□	A41K-□599□-□	A63K-□5913□-□
Max. stop torque	21 kgf cm (2.1 N m)	41 kgf cm (4.1 N m)	63 kgf cm (6.3 N m)
Rotor inertia moment	$1{,}400\times10^{-7}$ kg · m^2	$2{,}700\times10^{-7}$ kg · m^2	$4{,}000\times10^{-7}$ kg · m^2
Rated current	M: 1.4 A / Phase G: 2.8 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged) 01)	≈ 1.70 kg (≈ 2.15 kg)	≈ 2.80 kg (≈ 3.25 kg)	≈ 3.80 kg (≈ 4.25 kg)
	≈ 2.64 kg (≈ 2.74 kg)	≈ 3.74 kg (≈ 3.84 kg)	≈ 4.74 kg (≈ 4.84 kg)

01) Listed in order of $\frac{\text{Standard type}}{\text{Built-in brake type}}$

View product detail

Standard type

Built-in brake type

Motor phase	5-phase
Insulation class	B type (130°C)
Insulation resistance	Between motor coil and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength [01]	Between motor coil and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Temperature rise	≤ 80°C (5-phase excitation for rated current, while stop)
Ambient temp.	-10 to 50°C, storage: -25 to 85°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection rating	IP30 (IEC34-5 standard)
Approval	CE EAC
Stop angle error	± 3' (± 0.05°) (Full step, no load)
Shaft vibration	0.05 mm T.I.R.
Radial movement [02]	≤ 0.025 mm T.I.R.
Axial movement [03]	≤ 0.075 mm T.I.R.
Shaft concentricity	0.075 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) In case of rated current: 0.75 A / Phase, Between motor coil and case: 500 VAC~ 50 / 60 Hz for 1 minute
02) Amount of radial shaft displacement when applying radial load (5 N) to the end of the shaft.
03) Amount of axial shaft displacement when applying axial load (10 N) to the shaft.

Built-in brake type Frame size	**□ 42 mm**	**□ 60 mm**	**□ 85 mm**
Rated excitation voltage	24 VDC⎓ ±10%		
Rated excitation current	0.2 A	0.33 A	0.62 A
Static friction torque	≥ 0.18 N m	≥ 0.8 N m	≥ 4.0 N m
Rotation part inertia moment	3×10^{-7} kg · m^2	29×10^{-7} kg · m^2	153×10^{-7} kg · m^2
Insulation class	B type (130°C)		
B type brake	Brake is released when power ON, brake is locked when power OFF		
Operating time	≤ 25 ms	≤ 25 ms	≤ 60 ms
Releasing time	≤ 15 ms	≤ 20 ms	≤ 15 ms

Hollow Shaft Type

5-Phase Stepper Motors

(□ 42 / 60 / 85 mm)

AHK Series

Features

- Direct connection of Ball-screw, TM-screw and etc. without couplings
- No resonance (vibration, noise) due to removed coupling
- Low cost of applied system by improving the coupling accuracy and reducing the number of parts and installation process
- Compact and light weight with high accuracy, high speed and high torque
- Ideal for building compact sized system

Specifications

Model	AH1K-S543-□	AH2K-S544-□	AH3K-S545-□
Max. stop torque	1.3 kgf cm (0.13 N m)	1.8 kgf cm (0.18 N m)	2.4 kgf cm (0.24 N m)
Rotor inertia moment	35×10^{-7} kg · m^2	54×10^{-7} kg · m^2	68×10^{-7} kg · m^2
Rated current	0.75 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged)	≈ 0.25 kg (≈ 0.35 kg)	≈ 0.30 kg (≈ 0.40 kg)	≈ 0.40 kg (≈ 0.50 kg)

Model	AH4K-□564□-□	AH8K-□566□-□	AH16K-□569□-□
Max. stop torque	4.2 kgf cm (0.42 N m)	8.3 kgf cm (0.83 N m)	16.6 kgf cm (1.66 N m)
Rotor inertia moment	175×10^{-7} kg · m^2	280×10^{-7} kg · m^2	560×10^{-7} kg · m^2
Rated current	S: 0.75 A / Phase M: 1.4 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged)	≈ 0.60 kg (≈ 0.87 kg)	≈ 0.80 kg (≈ 1.07 kg)	≈ 1.30 kg (≈ 1.57 kg)

Model	AH21K-□596□-□	AH41K-□599□-□	AH63K-□5913□-□
Max. stop torque	21 kgf cm (2.1 N m)	41 kgf cm (4.1 N m)	63 kgf cm (6.3 N m)
Rotor inertia moment	$1{,}400\times10^{-7}$ kg · m^2	$2{,}700\times10^{-7}$ kg · m^2	$4{,}000\times10^{-7}$ kg · m^2
Rated current	M: 1.4 A / Phase G: 2.8 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged)	≈ 1.70 kg (≈ 2.18 kg)	≈ 2.80 kg (≈ 3.28 kg)	≈ 3.80 kg (≈ 4.28 kg)

Motor phase	5-phase
Insulation class	B type (130°C)
Insulation resistance	Between motor coil and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength 01)	Between motor coil and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Temperature rise	≤ 80°C (5-phase excitation for rated current, while stop)
Ambient temp.	-10 to 50°C, storage: -25 to 85°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection rating	IP30 (IEC34-5 standard)
Approval	CE EAC

01) In case of rated current: 0.75 A / Phase, Between motor coil and case: 500 VAC~ 50 / 60 Hz for 1 minute

View product detail

Built-In Gear / Rotary Actuator Type

5-Phase Stepper Motors

(☐ 42 / 60 / 85 mm)

AK-G / AK-R Series

Features

- Ideal for building compact sized system
- Low price for improved cost efficiency
- Backlash ☐ 42 mm: ± 35' (0.58˚), ☐ 60 mm: ± 20' (0.33˚), ☐ 85 mm: ± 15' (0.25˚)
- Brake releases when 24 VDC is applied on brake wire (AK-GB Series, AK-RB Series)
- Basic step angle 1:5 → 0.144˚, 1:7.2 → 0.1˚, 1:10 → 0.072˚
- Allowable speed 1:5 → 0 to 360 rpm, 1:7.2 → 0 to 250 rpm, 1:10 → 0 to 180 rpm

Specifications

Model	A10K-S545☐-☐5	A15K-S545☐-☐7.2	A15K-S545☐-☐10
Max. allowable torque	10 kgf cm (1.0 N m)	15 kgf cm (1.5 N m)	
Rotor inertia moment 01)	68×10^{-7} kg · m^2		
Rated current	0.75 A / Phase		
Basic step angle	0.144° / 0.072° (Full / Half step)	0.1° / 0.05° (Full / Half step)	0.072° / 0.036° (Full / Half step)
Allowable speed range	0 to 360 rpm	0 to 250 rpm	0 to 180 rpm
Backlash	± 35' (0.58°)		
Unit weight (packaged) 02)	≈ 0.58 kg (≈ 0.68 kg)		
	≈ 0.72 kg (≈ 0.78 kg)		

Model	A35K-M566☐-☐5	A40K-M566☐-☐7.2	A50K-M566☐-☐10
Max. allowable torque	35 kgf cm (3.5 N m)	40 kgf cm (4.0 N m)	50 kgf cm (5.0 N m)
Rotor inertia moment 01)	280×10^{-7} kg · m^2		
Rated current	1.4 A / Phase		
Basic step angle	0.144° / 0.072° (Full / Half step)	0.1° / 0.05° (Full / Half step)	0.072° / 0.036° (Full / Half step)
Allowable speed range	0 to 360 rpm	0 to 250 rpm	0 to 180 rpm
Backlash	± 20' (0.33°)		
Unit weight (packaged) 02)	Built-in gear type: ≈ 1.30 kg (≈ 1.57 kg) Built-in rotary actuator type: ≈ 1.30 kg (≈ 1.40 kg)		
	Built-in gear type: ≈ 0.95 kg (≈ 1.03 kg) Built-in rotary actuator type: ≈ 1.60 kg (≈ 1.70 kg)		

Model	A140K-☐599☐-☐5	A200K-☐599☐-☐7.2	A200K-☐599☐-☐10
Max. allowable torque	140 kgf cm (14.0 N m)	200 kgf cm (20.0 N m)	
Rotor inertia moment 01)	$2{,}700\times10^{-7}$ kg · m^2		
Rated current	M: 1.4 A / Phase G: 2.8 A / Phase		
Basic step angle	0.144° / 0.072° (Full / Half step)	0.1° / 0.05° (Full / Half step)	0.072° / 0.036° (Full / Half step)
Allowable speed range	0 to 360 rpm	0 to 250 rpm	0 to 180 rpm
Backlash	± 15' (0.25°)		
Unit weight (packaged) 01)	≈ 4.40 kg (≈ 4.88 kg)		
	≈ 2.64 kg (≈ 2.74 kg)		

01) Listed in order of $\frac{\text{Standard type}}{\text{Built-in brake type}}$

View product detail

Built-in gear type

Geared type with built-in brakes

Rotary actuator type

Rotary actuator type with built-in brakes

Next Page ▶

Motor phase	5-phase
Insulation class	B type (130°C)
Insulation resistance	Between motor coil and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength [01]	Between motor coil and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Temperature rise [02]	≤ 80°C (5-phase excitation for rated current, while stop)
Ambient temp.	-10 to 50°C, storage: -25 to 85°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection rating	IP30 (IEC34-5 standard)
Approval	CE EAC
Stop angle error [02]	± 3' (± 0.05°) (Full step, no load)
Absolut position error [03]	± 20' (± 0.33°)
Lost motion [03]	± 20' (± 0.33°)
Shaft vibration	0.05 mm T.I.R.
Radial movement [04]	≤ 0.025 mm T.I.R.
Axial movement [05]	≤ 0.075 mm T.I.R.
Shaft concentricity	0.075 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) In case of rated current: 0.75 A / Phase, Between motor coil and case: 500 VAC~ 50 / 60 Hz for 1 minute
02) The corresponding value is only available in built-in gear type.
03) The corresponding value is only available in built-in rotary actuator type.
04) Amount of radial shaft displacement when applying radial load (5 N) to the end of the shaft.
05) Amount of axial shaft displacement when applying axial load (10 N) to the shaft.

Built-in brake type **Frame size**	**□ 42 mm**	**□ 60 mm**	**□ 85 mm**
Rated excitation voltage	24 VDC⎓ ±10%		
Rated excitation current	0.2 A	0.33 A	0.62 A
Static friction torque	≥ 0.18 N m	≥ 0.8 N m	≥ 4.0 N m
Rotation part inertia moment	3×10^{-7} kg · m^2	29×10^{-7} kg · m^2	153×10^{-7} kg · m^2
Insulation class	B type (130°C)		
B type brake	Brake is released when power ON, brake is locked when power OFF		
Operating time	≤ 25 ms	≤ 25 ms	≤ 60 ms
Releasing time	≤ 15 ms	≤ 20 ms	≤ 15 ms

Micro Step
5-Phase Stepper Motor Drivers

MD5-HD14 Series

Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Low speed rotation and extreme precision control with micro stepping drive (Max. resolution is 250 divisions. In case of 5 phase stepper motor with 0.72° basic step angle, it can be controlled down to 0.00288° per pulse, 125000 pulses are required for a single revolution.)
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-HD14
Power supply [01]	24 - 35 VDC⎓ ± 10%
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current [02]	0.4 - 1.4 A / Phase
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)
RUN method	Bipolar constant current pentagon drive
Basic step angle	0.72° / Step
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)
Pulse width	≥ 10 μs (CW / CCW), ≥ 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 130 ns (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC⎓, [L]: 0 - 0.5 VDC⎓
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF, DIVISION SELECTION, ZERO OUT)
Max. input pulse freq.	≤ 500 kHz (CW / CCW)
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF, DIVISION SELECTION), 10 Ω (ZERO OUT)
Insulation resistance	Between all terminal and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	Between all terminal and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Noise immunity	± 500 VDC⎓ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 10 minutes
Ambient temp.	0 to 40°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Approval	CE EAC
Unit weight (packaged)	≈ 220 g (≈ 327.5 g)

01) If a power supply is over 30 VDC⎓, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area. The torque may vary depending on power supply.
02) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.

View product detail

Micro Step

5-Phase Stepper Motor Drivers

MD5-HF14 Series

Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Low speed rotation and extreme precision control with micro stepping drive (Max. resolution is 250 divisions. In case of 5 phase stepper motor with 0.72° basic step angle, it can be controlled down to 0.00288° per pulse, 125000 pulses are required for a single revolution.)
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-HF14
Power supply	100 - 220 VAC~ 50 / 60 Hz ± 10%
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current [01]	0.4 - 1.4 A / Phase
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)
RUN method	Bipolar constant current pentagon drive
Basic step angle	0.72° / Step
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)
Pulse width	≥ 1 μs (CW / CCW), ≥ 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 130 ns (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC⎓, [L]: 0 - 0.5 VDC⎓
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF, DIVISION SELECTION, ZERO OUT)
Max. input pulse freq.	≤ 500 kHz (CW / CCW)
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF, DIVISION SELECTION), 10 Ω (ZERO OUT)
Insulation resistance	Between all terminal and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	Between all terminal and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Noise immunity	± 2000 VDC⎓ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 10 minutes
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Approval	CE c UL us EAC
Unit weight (packaged)	≈ 690 g (≈ 840 g)

01) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.

View product detail

Micro Step
5-Phase Stepper Motor Drivers

MD5-HF14-AO Series

Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Low speed rotation and extreme precision control with micro stepping drive (Max. resolution is 250 divisions. In case of 5 phase stepper motor with 0.72° basic step angle, it can be controlled down to 0.00288° per pulse, 125000 pulses are required for a single revolution.)
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-HF14-AO
Power supply	100 - 220 VAC~ 50 / 60 Hz ± 10%
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current [01]	0.4 - 1.4 A / Phase
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)
RUN method	Bipolar constant current pentagon drive
Basic step angle	0.72° / Step
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)
Pulse width	≥ 1 μs (CW / CCW), ≥ 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 130 ns (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC⎓, [L]: 0 - 0.5 VDC⎓
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF)
Max. input pulse freq.	≤ 500 kHz (CW / CCW)
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF), 10 Ω (ALARM)
Insulation resistance	Between all terminal and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	Between all terminal and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Noise immunity	± 2000 VDC⎓ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 10 minutes
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Approval	CE c UL us EAC
Unit weight (packaged)	≈ 660 g (≈ 820 g)

01) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.

View product detail

Micro Step

5-Phase Stepper Motor Drivers

MD5-HF28 Series

Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Low speed rotation and extreme precision control with micro stepping drive (Max. resolution is 250 divisions. In case of 5 phase stepper motor with 0.72° basic step angle, it can be controlled down to 0.00288° per pulse, 125000 pulses are required for a single revolution.)
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

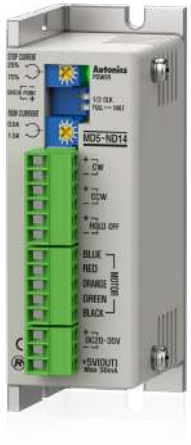
Model	MD5-HF28
Power supply	100 - 220 VAC⁓ 50 / 60 Hz ± 10%
Max. current consumption	5 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current 01)	1.0 - 2.8 A / Phase
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)
RUN method	Bipolar constant current pentagon drive
Basic step angle	0.72° / Step
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)
Pulse width	≥ 1 μs (CW / CCW), ≥ 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 130 ns (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC⎓, [L]: 0 - 0.5 VDC⎓
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF, DIVISION SELECTION, ZERO OUT)
Max. input pulse freq.	≤ 500 kHz (CW / CCW)
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF, DIVISION SELECTION), 10 Ω (ZERO OUT)
Insulation resistance	Between all terminal and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	Between all terminal and case: 1,000 VAC⁓ 50 / 60 Hz for 1 minute
Noise immunity	± 2000 VDC⎓ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 10 minutes
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Approval	CE c UL us EAC
Unit weight (packaged)	≈ 1.2 kg (≈ 1.35 kg)

01) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.

View product detail

Micro Step
5-Phase Stepper Motor Drivers

MD5-ND14 Series



Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-ND14
Power supply [01]	20 - 35 VDC⎓ ± 10%
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current [02]	0.5 - 1.5 A / Phase
Stop current	25 to 75% of RUN current (set by STOP current setting rotary switch)
RUN method	Bipolar constant current pentagon drive
Basic step angle	0.72° / Step
Resolution	1 division (0.72° / Step), 2 division (0.36° / Step)
Pulse width	≥ 10 μs (CW / CCW), 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 130 ns (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC⎓, [L]: 0 - 0.5 VDC⎓
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF)
Max. input pulse freq.	≤ 50 kHz (CW / CCW)
Input resistance	390 Ω (CW/CCW, HOLD OFF)
Insulation resistance	Between all terminal and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	Between all terminal and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Noise immunity	± 500 VDC⎓ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 10 minutes
Ambient temp.	0 to 40°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Approval	CE EAC
Unit weight (packaged)	≈ 130 g (≈ 183 g)

01) If a power supply is over 30 VDC⎓, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area. The torque may vary depending on power supply.
02) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.

View product detail

Micro Step

5-Phase Stepper Motor Drivers

MD5-HD14-2X / MD5-HD14-3X Series

Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-HD14-2X	MD5-HD14-3X
Number of axes	2-axis	3-axis
Power supply 01)	20 - 35 VDC⎓ ± 10%	
Max. current consumption 02)	5 A	7 A
RUN current 03)	0.4 - 1.4 A / Phase	
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)	
RUN method	Bipolar constant current pentagon drive	
Basic step angle	0.72° / Step	
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)	
Pulse width	≥ 1 μs (CW / CCW), ≥ 1 ms (HOLD OFF)	
Duty rate	50% (CW / CCW)	
Rise, Fall time	≤ 130 ns (CW / CCW)	
Pulse input voltage	[H]: 4 - 8 VDC⎓, [L]: 0 - 0.5 VDC⎓	
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF, ZERO OUT)	
Max. input pulse freq.	≤ 500 kHz (CW / CCW)	
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF), 10 Ω (ZERO OUT)	
Insulation resistance	Between all terminal and case: ≥ 100 MΩ (500 VDC⎓ megger)	
Dielectric strength	Between all terminal and case: 1,000 VAC~ 50 / 60 Hz for 1 minute	
Noise immunity	± 500 VDC⎓ square wave noise (pulse width: 1 μs) by the noise simulator	
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz (for 1 minute) in each X, Y, Z direction for 10 minutes	
Ambient temp.	0 to 40°C, storage: -10 to 60°C (no freezing or condensation)	
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)	
Approval	CE EAC	
Unit weight (packaged)	≈ 292 g (≈ 446 g)	≈ 411 g (≈ 597 g)

01) If a power supply is over 30 VDC⎓, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area. The torque may vary depending on power supply.
02) Based on ambient temp. 25°C, ambient humi. 55%RH
03) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.

View product detail

G4. Motion Controllers

Motion controllers are devices that generate pulse signals for precise and proper control of stepper motor drivers and stepper motors.

G4-1	Stand-Alone	PMC-1HS / PMC-2HS Series	1 Axis / 2 Axis Motion Controllers
		PMC-2HSP Series	2 Axis Interpolation Type Motion Controllers
G4-2	PCI Card	PMC-4B-PCI Series	4 Axis Board Type Motion Controllers

1 Axis / 2 Axis
Motion Controllers

PMC-1HS / PMC-2HS Series

Features

- High-speed processing up to 4 Mpps
- 4 operation modes: Scan mode, Continuous mode, Index mode, Program mode
- 12 control commands and up to 64 steps of programming per axis
- Parallel interface input/output terminal to communicate with various PLCs
- Operation programming, parameter configuration and editing with dedicated software
- Joystick signal support for convenient XY stage control
- Remote controlling possible with serial port (RS232C) on all models
- Teaching and monitoring with Teaching Unit (PMC-2TU-232)

Specifications

Model	PMC-1HS-232	PMC-1HS-USB	PMC-2HS-232	PMC-2HS-USB
Power supply	24 VDC⎓ ± 10%			
Power consumption	≤ 6 W			
Control axes	1 axis		2 axis (each axis can be programmed independently)	
Motor control	Pulse input stepper motor or servo motor			
In-Position setting	ABSOLUTE method / INCREMENTAL method			
In-Position range	-8,388,608 to +8,388,607 (available pulse scaling function)			
Drive speed	1 pps to 4 Mpps (1 to 8000×magnification 1 to 500)			
Pulse output method	2 pulse output method (line driver output)			
Operation mode	Jog mode, Continuous mode, Index mode, Program mode			
No. of drive speed	4			
Program save	EEPROM			
Index steps	64 step per each axis			
Steps	64 Step			
Control command	ABS, INC, HOM, IJP, OUT, OTP, JMP, REP, RPE, END, TIM, NOP			
Program function	Power On Program Start, Power On Home Search			
Home search mode	High speed near home search (STEP1) → Low speed near home search (STEP2) → Encoder Z phase search (STEP3) → Offset movement (STEP4) Configuring the detection direction and Enable/Disable in each step			
General output	1 point		2 point	
Control interface	Parallel I/F			
Ambient temp.	0 to 45°C (no freezing or condensation)			
Ambient humi.	35 to 85%RH (no freezing or condensation)			
Approval	CE EAC			
Unit weight (packaged)	≈ 96.8 g (≈ 386 g)	≈ 96.9 g (≈ 421.6 g)	≈ 100.2 g (≈ 393.6 g)	≈ 100.4 g (≈ 432.2 g)

View product detail

2 Axis
Interpolation Type
Motion Controllers

PMC-2HSP Series

Features

- High speed independent 2 axis control with processing speed up to 4 Mpps
- Supports linear and circular interpolation control
- 17 control commands and up to 200 steps of operation programming
- Supports various control interfaces (USB, RS232C, RS485, Parallel I/F)
- Multiple control of up to 32 axes (16 units) with RS485 communication (Modbus RTU)
- 4 operation modes: Jog mode, Continuous mode, Index mode, Program mode
- Symmetrical / asymmetrical trapezoid or S-shaped acceleration/deceleration control

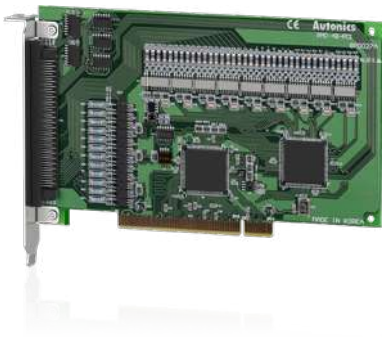
Specifications

Model	PMC-2HSP-USB	PMC-2HSP-485
Power supply	24 VDC⎓ ± 10%	
Power consumption	≤ 6 W	
Control output	50 mA	
Control axes	2 axis	
Motor control	Pulse input stepper motor or servo motor	
In-Position range	-8,388,608 to +8,388,607 (selectable absolute / relative value, available pulse scaling function)	
Drive speed	1 pps to 4 Mpps (1 to 8,000 pps×magnification 1 to 500)	
Pulse output method	1 pulse / 2 pulse output method (line driver output)	
Operation mode	Jog mode, Continuous mode, Index mode, Program mode	
Index steps	64 step for each axis	
Steps	200 steps	
Control command	ABS, INC, HOM, LID, CID, FID, RID, FRID, TIM, JMP, REP, RPE, ICJ, IRD, OPC, OPT, NOP, END	
Program function	Power On Program Start, Power On Home Search	
Home search mode	High speed near home search (STEP1) → Low speed near home search (STEP2) → Encoder Z phase search (STEP3) → Offset movement (STEP4)	
I/O	Parallel I/F (CN3): 13 inputs, 4 outputs X axis (CN4): 8 inputs, 6 outputs (2 general input, 2 general output) Y axis (CN5): 8 inputs, 6 outputs (2 general input, 2 general output)	
Ambient temp.	0 to 45°C, storage: -15 to 70°C (no freezing or condensation)	
Ambient humi.	20 to 90%RH, storage: 20 to 90%RH (no freezing or condensation)	
Approval	CE KC EAC	CE EAC
Unit weight (packaged)	≈ 101.5 g (≈ 344 g)	≈ 101.6 g (≈ 308.7 g)

View product detail

4 Axis
Board Type
Motion Controllers

PMC-4B-PCI Series



Features

- Independent 4-axis control of AC servo motors and stepper motors
- PC-PCI card type
- Auto home search function and synchronous operation
- Interpolation control for circular, linear, bit pattern, continuous, acceleration, and deceleration drives
- 2-axis / 3-axis constant linear velocity
- Supports Windows 98, NT, 2000, XP, Windows 7
- Labview library and help, and C language library and samples available on www.autonics.com

View product detail

Specifications

Model	PMC-4B-PCI
Power supply	5 VDC⎓ ± 10% (using PC internal power)
External power supply	12 - 24 VDC⎓ ± 10%
Control axes	4 axis
CPU data bus	8 / 16 bit selection
Ambient temp.	0 to 45°C, storage: -10 to 55°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Approval	CE KC EAC
Unit weight (packaged)	≈ 100.4 g (≈ 654.4 g)
2/3 axis linear interpolation range	-2,147,483,648 to +2,147,483,647 for each axis
2/3 axis linear interpolation speed	1 pps to 4 Mpps
2/3 axis linear interpolation position accuracy	≤ ±0.5 LBS (within all interpolation range)
2/3 axis bit pattern interpolation speed	1 pps to 4 Mpps (depending on CPU data setup time)
Circular interpolation range	-2,147,483,648 to +2,147,483,647 for each axis
Circular interpolation speed	1 pps to 4 Mpps
Circular interpolation position accuracy	≤ ±1 LBS (within all interpolation range)
Other interpolation function	Select specific axis, constant linear velocity, continuous interpolation step transmission (command, external signal)
Encoder input pulse	2-phase pulse / up down pulse input, 2-phase pulse 1 / 2 / 4-multiply selection
Logic pos. counter range	-2,147,483,648 to +2,147,483,647 (for output pulse)
Actual pos. counter range	-2,147,483,648 to +2,147,483,647 (for input pulse)
Compare register	Comp. ±register pos. comparison range: -2,147,483,648 to +2,147,483,647 Output and signal output when the current counter value and the user position counter are same Software limit operation
Auto home search	High speed near home search (step1) → Low speed near home search (step2)
Interrupt function (except interpolation)	1 drive pulse output: when changing position counter ≥ Comp.-, when changing position counter ≥ Comp.+, when changing position counter < Comp.-, when changing position counter < Comp.+, when starting constant speed in accel/decel drive, when ending constant speed in accel/decel drive, when ending drive auto home search, when ending auto home search, when running synchronous operation
Drive control by external signal	± direction fixed/continuous pulse drive by EXP+, EXP- signal 2-phase encoder signal mode (encoder input) drive
External deceleration stop / immediate stop signal	IN 0 to 3 each axis 4 point Select signal valid/invalid and logic level selection, use general input
Servo motor input signal	Select alarm, INPOS signal valid/invalid and logic level
General output signal	OUT4 to 7 each axis 4 point (both drive status output signal and terminal)
Drive status signal output	ASND (while acceleration), DSND (while deceleration)
Overrun limit signal input	Select +direction, -direction each 1 point and logic level Select stop/deceleration stop at active
Emergency stop signal input	EMG 1 point, stop drive pulse for all axes by low level
Integral filter	Built-in integral filter at each input signal input terminal, pass time (8 type) selection
Others	Select specific axis, constant linear velocity, continuous interpolation, interpolation step transmission (command, external signal)