Serie A2K

Motor a pasos de 2-fases 42mm/56mm

42mm 56mm

Características principales

- Diseño compacto, peso ligero y alta precisión, velocidad y torque.
- Accesible para aplicaciones en equipos de tamaño compacto.
- Tipo cable conector.
- Costo efectivo.

Como especificarlo

A | 2K | – | M | 2 | | | |

Tipo flecha		Sin marca	Flecha simple
		W	Flecha doble
Longitud del motor (mm)		3	34mm
		4	40mm
		5	47.5mm
Tamaño del marco del motor	4 (42×42mm)	4	43mm
		5	55mm
		8	79mm
	6 (56.4×56.4mm)	4	43mm
		5	55mm
		8	79mm
Fase del motor		2	2 fases
Corriente nominal		M	1.2A/Fase
		G	2.0A/Fase
Máx. torque mantenido		Torque	kgf·cm(Se refiere a las especificaciones del motor)
		Motor	

Tipo de motor

Motor		Modelo	Corriente nominal (A/fase)	Máx. torque mantenido (kgf · cm)	Momento de inercia del rotor (g · cm²)	Resistencia del bobinado(Ω)	Longitud del motor (mm)
42mm	Tipo flecha	A2K-M243	1.2	2.06	33	2.7	34
		A3K-M244(W)	1.2	2.97	56	3.3	40
		A4K-M245	1.2	3.30	72	2.8	47.5
56mm		A6K-G264(W)	2	5.70	145.0	1.3	43
		A9K-G265(W)	2	9.00	245.0	1.7	55
		A16K-G268	2	15.70	470.0	2.5	79

※(W) significa flecha doble. El tipo con freno integrado, solo tiene una flecha. ※La longitud del motor no incluye la longitud de la flecha.

Serie MD2U

Driver para motor a pasos de 2-fases/ Compacto, de alto rendimiento

Características

· Drive de corriente constante unipolar
· Permitir frenar cuando se detiene por medio del ajuste de corriente STOP
· Baja velocidad y control preciso con micro-pasos (MD2U-MD20)
· Aisla mediante optoacoplador para minimizar la influencia por ruido externo

MD2U-MD20

MD2U-ID20

Como especificarlo

MD | 2 | U | – | M | D | 20

Corriente RUN	20	2A/Fase
Alimentación	D	24-35VCC
Método de paso (resolución)	M	Micro pasos (20-divisiones)
	I	Inteligente
Método del drive	U	Drive unipolar
Fase del motor	2	2-fases
Modelo	MD	Driver del motor

Especificaciones

Modelo	MD2U-MD20	MD2U-ID20
Alimentación	24-35VCC⎓	
Rango de voltaje permitido	90 a 110% del voltaje nominal	
Máx. consumo de corriente	3A	
Corriente RUN	0.5-2A/fase	
Corriente STOP	20 a 70% de corriente RUN (ajuste por volumen de corriente STOP)	
Método del drive	Drive de corriente unipolar constante	
Ángulo de paso básico	1.8˚/Pasos	
Máx. velocidad del drive	—	1500rpm
Resolución	1, 2, 4, 5, 8, 10, 16, 20-divisiones (1.8˚ a 0.09˚/paso)	

Serie AiS/AiC

Sistema de motor a pasos con lazo cerrado de 2-fases

Diagrama de configuración AiS

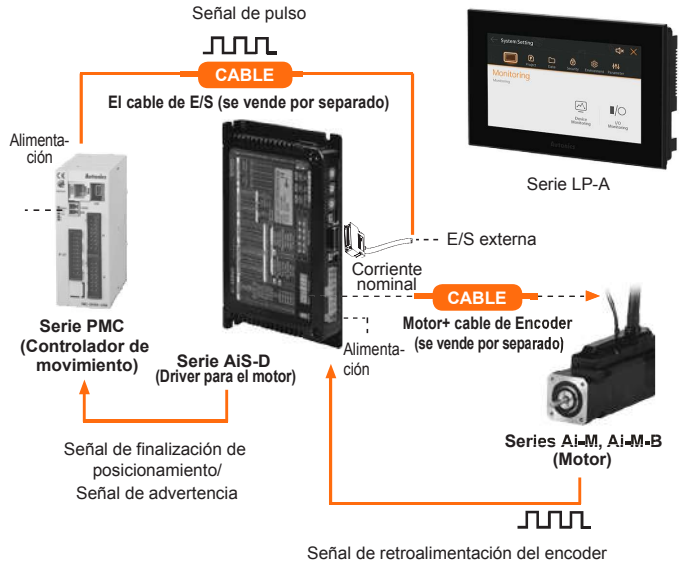
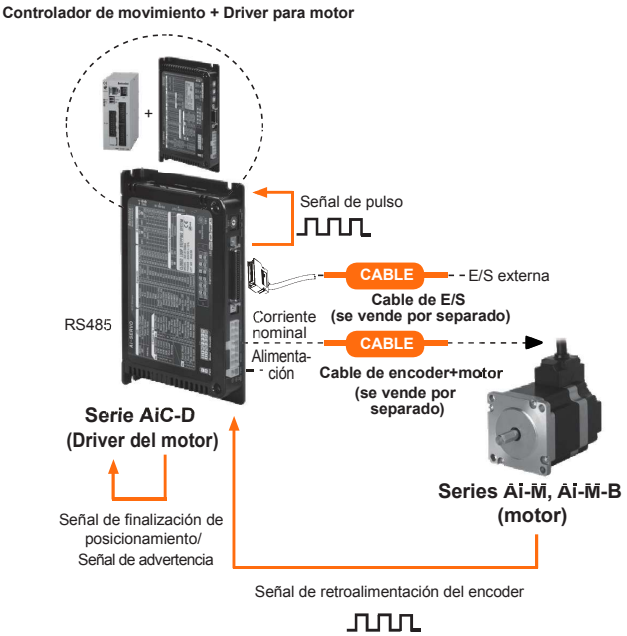


Diagrama de configuración AiC



EtherNet/IP EtherCAT Conformance tested Modbus RTU

Tipo			Modelo		Tipo de motor	Tamaño del marco del motor						
						20 mm	28 mm	35 mm	42 mm	56 mm	60 mm	86 mm
Tipo de entrada de pulso		CC	AiS		Estándar	○	○	○	○	○	○	
					Freno integrado		○	○	○	○	○	
					Engrane integrado				○		○	
					Actuador rotativo integrado						○	
		CA	AiSA		Estándar						○	○
					Freno integrado						○	○
					Engrane integrado						○	○
					Actuador rotativo integrado						○	
Tipo controlador integrado	Modbus RTU	CC	AiC		Estándar	○	○	○	○	○	○	
					Freno integrado				○	○	○	
					Engrane integrado				○		○	
					Actuador rotativo integrado						○	
		CA	AiCA		Estándar						○	○
					Freno integrado						○	○
					Engrane integrado						○	○
					Actuador rotativo integrado						○	
	EtherCAT	CC	AiC-EC		Estándar	○	○	○	○	○	○	
					Freno integrado				○	○	○	
					Engrane integrado				○		○	
					Actuador rotativo integrado						○	
		CA	AiCA-EC		Estándar						○	○
					Freno integrado						○	○
					Engrane integrado						○	○
					Actuador rotativo integrado						○	
	CC-Link	CC	AiC-CL		Estándar	○	○	○	○	○	○	
					Freno integrado				○	○	○	
					Engrane integrado				○		○	
					Actuador rotativo integrado						○	

Serie Ai-M/AiA-M

Sistema de motor a pasos con lazo cerrado

Motores a pasos con lazo cerrado de 2-fases

Tipo estándar

Modelo	Ai-M-20MA	Ai-M-20LA	Ai-M-28SB	Ai-M-28MB	Ai-M-28LB	Ai-M-35SB	Ai-M-35MB	Ai-M-35LB
Máx. torque de paro	0.018 N m	0.035 N m	0.05 N m	0.14 N m	0.16 N m	0.07 N m	0.13 N m	0.31 N m
Momento de inercia del rotor	2×10^{-7} kg · m^2		9×10^{-7} kg · m^2	12×10^{-7} kg · m^2	18×10^{-7} kg · m^2	8×10^{-7} kg · m^2	14×10^{-7} kg · m^2	22×10^{-7} kg · m^2
Corriente nominal	0.6 A / Fase		1.0 A / Fase			1.2 A / Fase		
Ángulo de paso básico	1.8° / 0.9° (Completa / Medio paso)		1.8° / 0.9° (Completo / Medio paso)			1.8° / 0.9° (Completo / Medio paso)		

Tipo estándar / con freno integrado

Modelo	Ai-M-42SA-□	Ai-M-42MA-□	Ai-M-42LA-□	Ai-M-56SA-□	Ai-M-56MA-□	Ai-M-56LA-□	Ai-M-60SA-□	Ai-M-60MA-□	Ai-M-60LA-□
Máx. torque de paro	0.25 N m	0.4 N m	0.48 N m	0.6 N m	1.2 N m	2.0 N m	1.1 N m	2.2 N m	2.9 N m
Momento de inercia del rotor	35×10^{-7} kg · m^2	54×10^{-7} kg · m^2	77×10^{-7} kg · m^2	140×10^{-7} kg · m^2	280×10^{-7} kg · m^2	480×10^{-7} kg · m^2	240×10^{-7} kg · m^2	490×10^{-7} kg · m^2	690×10^{-7} kg · m^2
Corriente nominal	1.7 A / Fase			3.5 A / Fase			3.5 A / Fase		
Ángulo de paso básico	1.8° / 0.9° (Completa / Medio paso)			1.8° / 0.9° (Completa / Medio paso)			1.8° / 0.9° (Completa / Medio paso)		

Actuador rotativo

Modelo	Ai-M-42MA-G5	Ai-M-42MA-G7.2	Ai-M-42MA-G10	Ai-M-60MA-□5	Ai-M-60MA-□7.2	Ai-M-60MA-□10
Máx. torque de paro	1.5 N m	2 N m	2 N m	7 N m	9 N m	11 N m
Momento de inercia del rotor	54×10^{-7} kg · m^2			490×10^{-7} kg · m^2		
Corriente nominal	1.7 A / Fase			3.5 A / Fase		
Ángulo de paro estándar	0.36°	0.25°	0.18°	0.36°	0.25°	0.18°

Tipo AC

Modelo	AiA-M-60MA-□	AiA-M-60LA-□	AiA-M-86MA-□	AiA-M-86LA-□
Máx. torque de paro	1.1 N m	2.2 N m	2.8 N m	4.0 N m
Momento de inercia del rotor	240×10^{-7} kg · m^2	490×10^{-7} kg · m^2	$1{,}100\times10^{-7}$ kg · m^2	$1{,}800\times10^{-7}$ kg · m^2
Corriente nominal	2.0 A / Fase		2.0 A / Fase	
Ángluo de paso básico	1.8° / 0.9° (Completa / Medio paso)		1.8° / 0.9° (Completa / Medio paso)	

Tipo AC / Actuador rotativo / Freno integrado

Modelo	AiA-M-60LA-□5	AiA-MA-60LA-□7.2	AiA-MA-60LA-□10	AiA-M-86LA-G5	AiA-M-86LA-G7.2	AiA-M-86LA-G10
Máx. torque de paro	7 N m	9 N m	11 N m	20 N m	28 N m	35 N m
Momento de inercia del rotor	490×10^{-7} kg · m^2			1800×10^{-7} kg m^2		
Corriente nominal	2.0 A / Fase			2.0 A / Fase		
Ángulo de paso estándar	0.36°	0.25°	0.18°	0.36°	0.25°	0.18°

Series AK(B)/AHK/AK-G(B)/AK-R(B)

Motores a pasos 5-fases


Serie AK
Tipo flecha


Serie AK-B
Con freno integrado


Serie AHK
Con flecha hueca


Serie AK-G
Con reductor


Serie AK-GB
Reductor + Freno integrado


Serie AK-R
Con actuador rotativo


Serie AK-RB
Actuador rotativo + Freno integrado

Especificaciones

◎: **Especificaciones de alto torque, alta velocidad.**

Motor		Modelo	Corriente nominal (A/Fase)	Máx. torque mantenido (kgf·cm)	Máx. torque disponible (kgf·cm)	Momento de rotor de inercia (gf·cm²)	Resistencia al viento (Ω)	Longitud del motor (mm)	Driver		
Tamaño del marco	Tipo								MD5-HD1/MD5-ND1/4 MD5-SD1/4-2(03)	MD5-HF1/4/ MD5-HF1/4-AO	MD5-HF28
24mm	Tipo flecha	**02K-S523(W)**	0.75	0.18	—	4.2	1.1	30.5	○	◎	—
		04K-S525(W)	0.75	0.28	—	8.2	1.7	46.5	○	◎	—
42mm	Tipo flecha/ Tipo freno integrado	**A1K-S543(W)-B**	0.75	1.3	—	35	1.7	33/56	○	◎	—
		A2K-S544(W)-B	0.75	1.8	—	54	2.2	39/62	○	◎	—
		A2K-M544(W)	1.4	1.8	—	54	2.2	39	○	◎	—
		A3K-S545(W)-B	0.75	2.4	—	68	2.2	47/70	○	◎	—
	Tipo flecha hueca	**AH1K-S543**	0.75	1.3	—	35	1.7	33	○	◎	—
		AH2K-S544	0.75	1.8	—	54	2.2	39	○	◎	—
		AH3K-S545	0.75	2.4	—	68	2.2	47	○	◎	—
	Tipo con engrane	**A10K-S545(W)-G5**	0.75	—	10	68	2.2	74.5	○	◎	—
		A15K-S545(W)-G7.2	0.75	—	15	68	2.2	74.5	○	◎	—
		A15K-S545(W)-G10	0.75	—	15	68	2.2	74.5	○	◎	—
	Tipo con engrane+ freno integrado	**A10K-S545-GB5**	0.75	—	10	68	2.2	97.5	○	◎	—
		A15K-S545-GB7.2	0.75	—	15	68	2.2	97.5	○	◎	—
		A15K-S545-GB10	0.75	—	15	68	2.2	97.5	○	◎	—
60mm	Tipo flecha/ freno integrado	**A4K-S564(W)-B**	0.75	4.2	—	175	2.6	48.5/75	○	◎	—
		A4K-M564(W)-B	1.4	4.2	—	175	0.8	48.5/75	○	◎	—
		A4K-G564(W)	2.8	4.2	—	175	0.26	48.5	—	—	◎
		A8K-S566(W)-B	0.75	8.3	—	280	4.0	59.5/86	○	◎	—
		A8K-M566(W)-B	1.4	8.3	—	280	1.1	59.5/86	○	◎	—
		A8K-G566(W)	2.8	8.3	—	280	0.35	59.5	—	—	◎
		A16K-M569(W)-B	1.4	16.6	—	560	1.8	89/115.5	○	◎	—
		A16K-G569(W)-B	2.8	16.6	—	560	0.56	89/115.5	—	—	◎
	Tipo flecha hueca	**AH4K-S564(W)**	0.75	4.2	—	175	2.6	48.5	○	◎	—
		AH4K-M564(W)	1.4	4.2	—	175	0.8	48.5	○	◎	—
		AH8K-S566(W)	0.75	8.3	—	280	4.0	59.5	○	◎	—
		AH8K-M566(W)	1.4	8.3	—	280	1.1	59.5	○	◎	—
		AH16K-M569(W)	1.4	16.6	—	560	1.8	89	○	◎	—
		AH16K-G569(W)	2.8	16.6	—	560	0.56	89	—	—	◎
	Tipo con engrane	**A35K-M566(W)-G5**	1.4	—	35	280	1.1	94.5	○	◎	—
		A40K-M566(W)-G7.2	1.4	—	40	280	1.1	94.5	○	◎	—
		A50K-M566(W)-G10	1.4	—	50	280	1.1	94.5	○	◎	—
	Tipo con engrane+ freno integrado	**A35K-M566-GB5**	1.4	—	35	280	1.1	121	○	◎	—
		A40K-M566-GB7.2	1.4	—	40	280	1.1	121	○	◎	—
		A50K-M566-GB10	1.4	—	50	280	1.1	121	○	◎	—
	Tipo actuador rotativo	**A35K-M566(W)-R5**	1.4	—	35	280	1.1	93.5	○	◎	—
		A40K-M566(W)-R7.2	1.4	—	40	280	1.1	93.5	○	◎	—
		A50K-M566(W)-R10	1.4	—	50	280	1.1	93.5	○	◎	—
	Actuador rotativo+ freno integrado	**A35K-M566-RB5**	1.4	—	35	280	1.1	120	○	◎	—
		A40K-M566-RB7.2	1.4	—	40	280	1.1	120	○	◎	—
		A50K-M566-RB10	1.4	—	50	280	1.1	120	○	◎	—
85mm	Tipo flecha Freno integrado	**A21K-M596(W)-B**	1.4	21	—	1400	1.76	68/103	○	◎	—
		A21K-G596(W)-B	2.8	21	—	1400	0.4	68/103	—	—	◎
		A41K-M599(W)-B	1.4	41	—	2700	2.6	98/133	○	◎	—
		A41K-G599(W)-B	2.8	41	—	2700	0.58	98/133	—	—	◎
		A63K-M5913(W)-B	1.4	63	—	4000	3.92	128/163	○	◎	—
		A63K-G5913(W)-B	2.8	63	—	4000	0.86	128/163	—	—	◎
	Tipo flecha hueca	**AH21K-M596(W)**	1.4	21	—	1400	1.76	68	○	◎	—
		AH21K-G596(W)	2.8	21	—	1400	0.4	68	—	—	◎
		AH41K-M599(W)	1.4	41	—	2700	2.6	98	○	◎	—
		AH41K-G599(W)	2.8	41	—	2700	0.58	98	—	—	◎
		AH63K-M5913(W)	1.4	63	—	4000	3.92	128	○	◎	—
		AH63K-G5913(W)	2.8	63	—	4000	0.86	128	—	—	◎
	Tipo con engrane	**A140K-M599(W)-G5**	1.4	—	140	2700	2.6	145	○	◎	—
		A140K-G599(W)-G5	2.8	—	140	2700	0.58	145	—	—	◎
		A200K-M599(W)-G7.2	1.4	—	200	2700	2.6	145	○	◎	—
		A200K-G599(W)-G7.2	2.8	—	200	2700	0.58	145	—	—	◎
		A200K-M599(W)-G10	1.4	—	200	2700	2.6	145	○	◎	—
		A200K-G599(W)-G10	2.8	—	200	2700	0.58	145	—	—	◎
	Tipo con engrane+ freno integrado	**A140K-M599-GB5**	1.4	—	140	2700	2 6	180	○	◎	—
		A140K-G599-GB5	2.8	—	140	2700	0.58	180	—	—	◎
		A200K-M599-GB7.2	1.4	—	200	2700	2.6	180	○	◎	—
		A200K-G599-GB7.2	2.8	—	200	2700	0.58	180	—	—	◎
		A200K-M599-GB10	1.4	—	200	2700	2.6	180	○	◎	—
		A200K-G599-GB10	2.8	—	200	2700	0.58	180	—	—	◎

※(W) significa flecha doble del motor. (el tipo de freno integrado permite solo el tipo de una flecha).
※La longitud del motor se mide sin flecha.
※El tipo de flecha hueca con cableo estándar es opcional. (excepto motor con marco de 24mm.)
※El torque del motor tiene una gran diferencia de torque por las características del driver.

Serie MD5

Drivers para motores a pasos 5-fases

(UL- Solo MD5-HF14/HF28)

Características principales

- Varias funciones incorporadas incluyendo baja de auto corriente y auto diagnóstico
- Drive de micro pasos (Resolución máxima: 250 divisiones)
- El diseño de entrada del fotoacoplador aislado minimiza la influencia del ruido externo
- Control de ejes múltiples (MD5-HD14-2X/3X)

Serie MD5-HD14-2X/3X | Serie MD5-ND14 | Serie MD5-HD14 | Serie MD5-HF14 | Serie MD5-HF28

Especificaciones

Modelo		MD5-HD14	MD5-HF14	MD5-HF14-AO	MD5-HF28	MD5-ND14
Alimentación		20-35VCC	100-220VCA 50/60Hz			20-35VCC
Rango de voltaje disponible		90 a 110% del voltaje nominal				
Máx. consumo de corriente		3A			5A	3A
Corriente RUN		0.4-1.4A/Fase			1.0-2.8A/Fase	0.5-1.5A/Fase
Corriente STOP		27 a 90% de corriente RUN (ajuste por interruptor de corriente STOP)				25 a 75% de corriente RUN (ajuste por volumen de corriente STOP)
Método drive		Drive pentagonal de corriente bipolar constante				
Ángulo de paso básico		0.72°/Paso				
Resolución		1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250-divisiones (0.72°a 0.00288°/Paso)				1, 2-divisiones (0.72°, 0.36°/Paso)
Características del pulso de entrada	Ancho de pulso	Mín. 1μs (CW, CCW), Min. 1ms (HOLD OFF)				Mín. 10μs (CW, CCW), Mín. 1ms (HOLD OFF)
	Ratio	50% (CW, CCW)				
	Tiempo de asc./desc.	Abajo de 130ns (CW, CCW)				
	Voltaje de entrada de pulso	[H]: 4-8VCC, [L]: 0-0.5VCC				
	Corriente de entrada de pulso	7.5-14mA (CW, CCW), 10-16mA (HOLD OFF, DIVISION SELECTION, ZERO OUT)				
	Máx. frecuencia del pulso de entrada	Máx. 500kHz (CW, CCW)				Máx. 50kHz (CW, CCW)
Resistencia de entrada		270Ω (CW, CCW), 390Ω (HOLD OFF, DIVISION SELECTION), 10Ω (ZERO OUT)		270Ω (CW, CCW), 390Ω (HOLD OFF), 10Ω (ALARM)	270Ω (CW, CCW), 390Ω (HOLD OFF, DIVISION SELECTION), 10Ω (ZERO OUT)	390Ω (CW, CCW, HOLD OFF)
Resistencia de aislamiento		Por encima de 100MΩ (a 500VCC meggers, entre las terminales y el cuerpo)				
Rigidez dieléctrica		1000VCA 50/60Hz por 1mín (entre las terminales y el cuerpo)				

Serie PMC

Controladores de Movimiento Programables de 2-ejes

Características principales

- Control de 2 ejes independientes de alta velocidad con velocidad de proceso de hasta 4Mpps
- 17 comandos de control y hasta 200 pasos de programación de operación
- Control múltiple hasta 32 ejes (16 unidades) con comunicación RS485 (Modbus RTU)
- Interfaz de conexión: RS232C/RS485/USB/Paralelo E/S

Especificaciones

Modelo		PMC-1HS-232	PMC-1HS-USB	PMC-2HS-232	PMC-2HS-USB
Ejes de control		1-eje		2-ejes (C/eje se puede programar de forma independiente)	
Alimentación		24VCC⎓±10%			
Consumo de alimentación		Máx. 6W			
Modo de operación		Modo JOG / CONTINUOUS / INDEX / PROGRAM			
Ajuste de posición		Método ABSOLUTE / INCREMENTAL			
Número de pasos de índice		64 índices por eje			
Rango de posición		-8,388,608 a +8,388,607 (admite la función de escala de pulso)			
Número de velocidad de conducción		4			
Velocidad del drive		1 pps a 4 Mpps (1 a 8,000 x aumento de 1 a 500)			
Método de salida de pulsos		Método de salida de 2-pulsos (salida line driver)			
Función de programa	Guardar	EEPROM			
	Pasos	64-pasos			
	Comando de control	ABS, INC, HOM, IJP, OUT, OTP, JMP, REP, RPE, END, TIM, NOP (12 tipos)			
	Inicio	Ajuste de inicio automático del programa de encendido disponible			
	Búsqueda de inicio	Ajuste de búsqueda de inicio de encendido disponible			

※La resistencia ambiental se encuentra en estado sin congelamiento o condensación.

Motion Devices

A New Standard for Motion Control

www.autonics.com

Autonics

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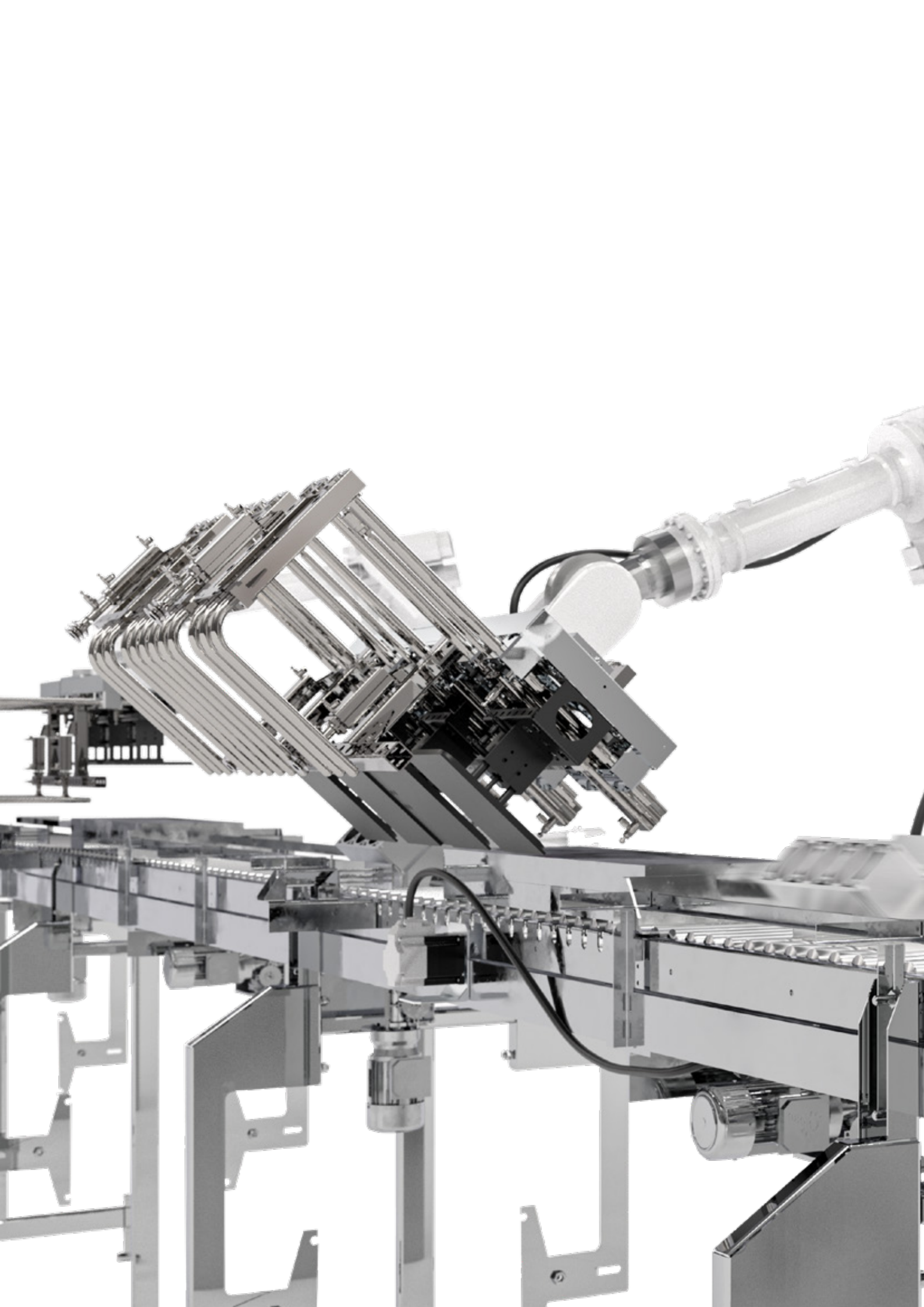
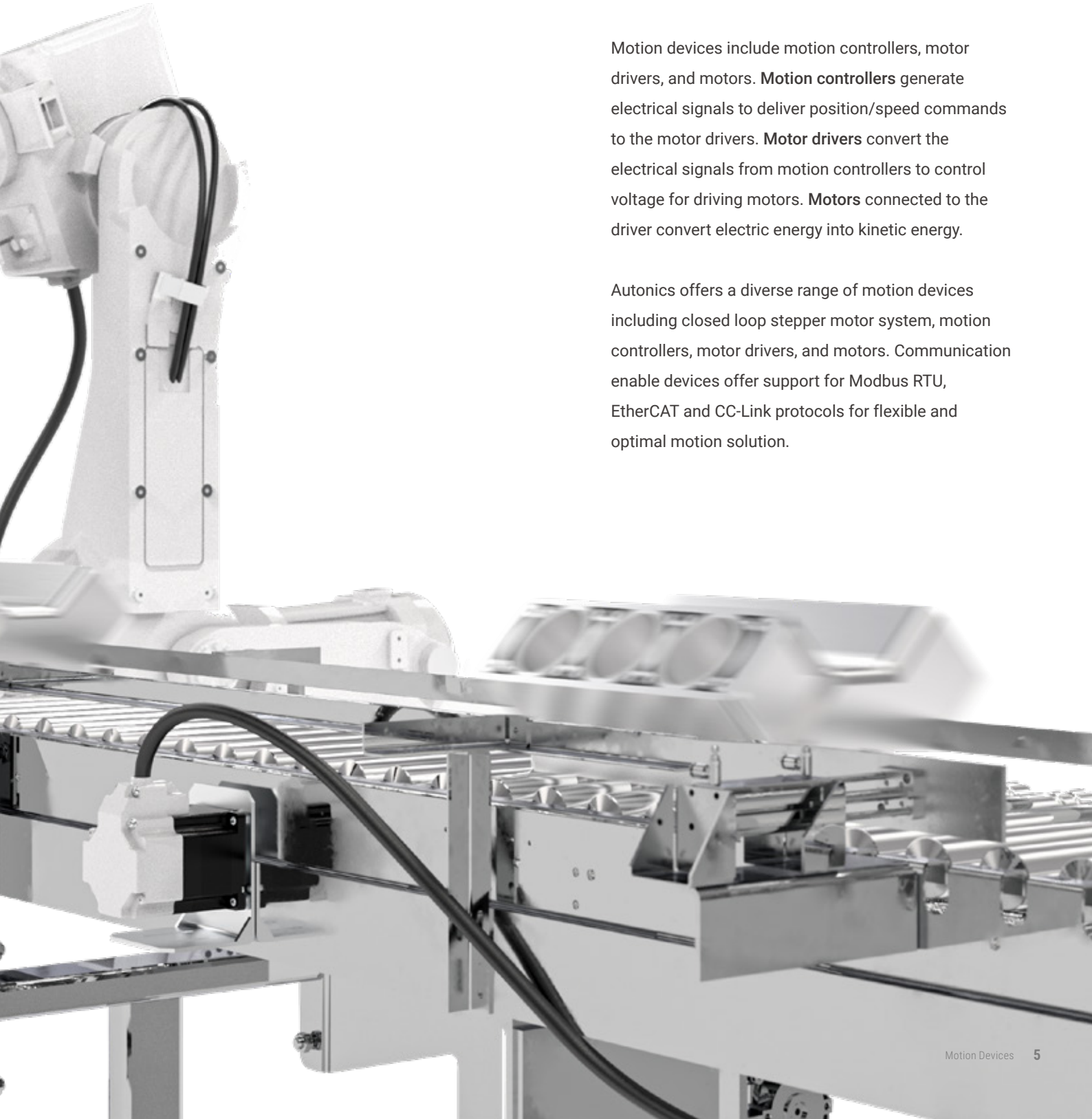


Motion Devices

Motion control is an essential, core component of automation. Motion control allows controlled movement of mechanical devices and parts for systematic automation. Various control methods are available including on/off control, position control, and speed and movement control. This is why motion control plays an important role in diverse industries including packaging, semiconductor, printing, textile, assembly and manufacturing.

Motion devices include motion controllers, motor drivers, and motors. **Motion controllers** generate electrical signals to deliver position/speed commands to the motor drivers. **Motor drivers** convert the electrical signals from motion controllers to control voltage for driving motors. **Motors** connected to the driver convert electric energy into kinetic energy.

Autonics offers a diverse range of motion devices including closed loop stepper motor system, motion controllers, motor drivers, and motors. Communication enable devices offer support for Modbus RTU, EtherCAT and CC-Link protocols for flexible and optimal motion solution.



Closed Loop Stepper Motor System

Closed loop stepper motor system controls stepper motors using a closed loop with an integrated encoder on the motors. Similar to a servo system, the motors receive feedback of the current motor shaft position and speed, and comparing and correcting the command value and detected value.

Autonics closed loop system offers accurate position control through feedback and also offers high torque drive. The advantages of stepper motors are also offered, including quick response rates and no hunting during stop. Users can also reduce stop times for high-speed and high-accuracy motion control with simple configuration.

The motors combine both advantages of servo motors and stepper motors for easy and accurate motion control, and can be applied in diverse motion applications.

Pulse Input Type

· **DC Power 2-Phase Closed-Loop Stepper Motor System** | AiS Series
· **AC Power 2-Phase Closed-Loop Stepper Motor System** | AiSA Series

Integrated Controller Type

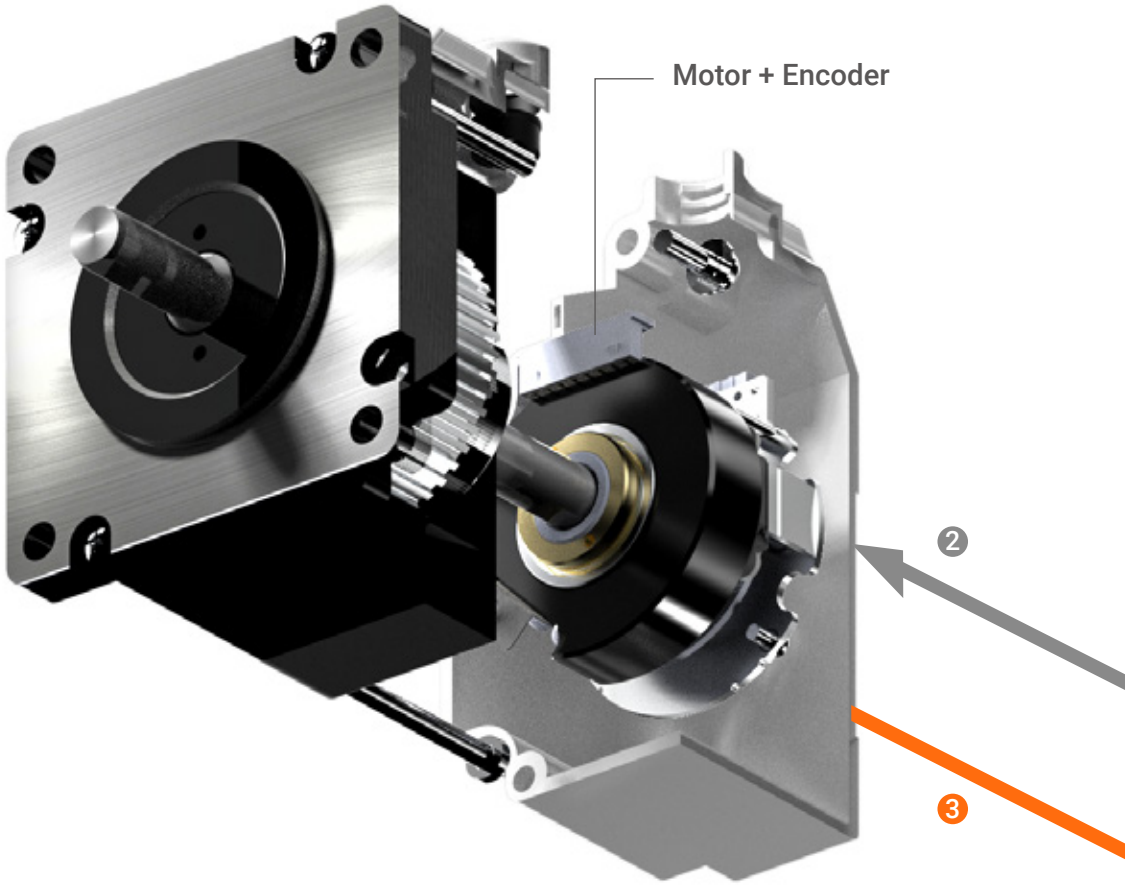
Modbus RTU Comm.
· **DC Power 2-Phase Closed-Loop Stepper Motor System** | AiC Series
· **AC Power 2-Phase Closed-Loop Stepper Motor System** | AiCA Series

EtherCAT Comm.
· **DC Power 2-Phase Closed-Loop Stepper Motor System** | AiC-EC Series
· **AC Power 2-Phase Closed-Loop Stepper Motor System** | AiCA-EC Series

CC-Link Comm.
· **DC Power 2-Phase Closed-Loop Stepper Motor System** | AiC-CL Series


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

Advantages of Autonics Closed Loop Stepper Motor System



1. Accurate Position Control with Feedback

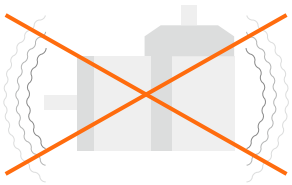
Autonics closed loop stepper motor system offers full closed loop control with a current control cycle of 25 μs, enabling high-precision position control. Closed loop stepper motor system changes the difference between the input pulse and the pulse from the encoder to 0. Then, after comparing the input signal and current position, when an error occurs, it controls until it gets back to the normal state through feedback. It provides accurate position control with feedback.

2. No Missed Steps

When the control is out of sync, the step motor misses steps and can't rotate as much as applied pulse. Closed loop stepper motor system has no missed steps by getting the current position information from the encoder. Even during load change or rapid acceleration/deceleration, without missed steps, it can reach the right position.

3. No Hunting

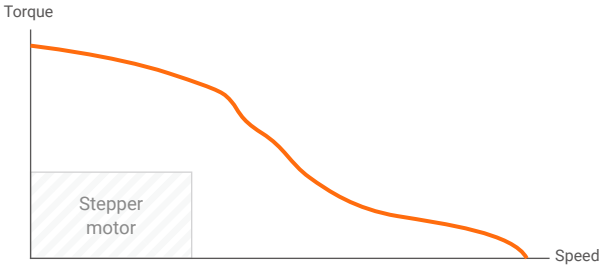
Unlike general servo motors, the Autonics closed loop stepper motor system has no hunting when it stops. It has stable holding power and can be used in machinery that requires precision. With strong self-holding power, users can control the stop poistion exactly.

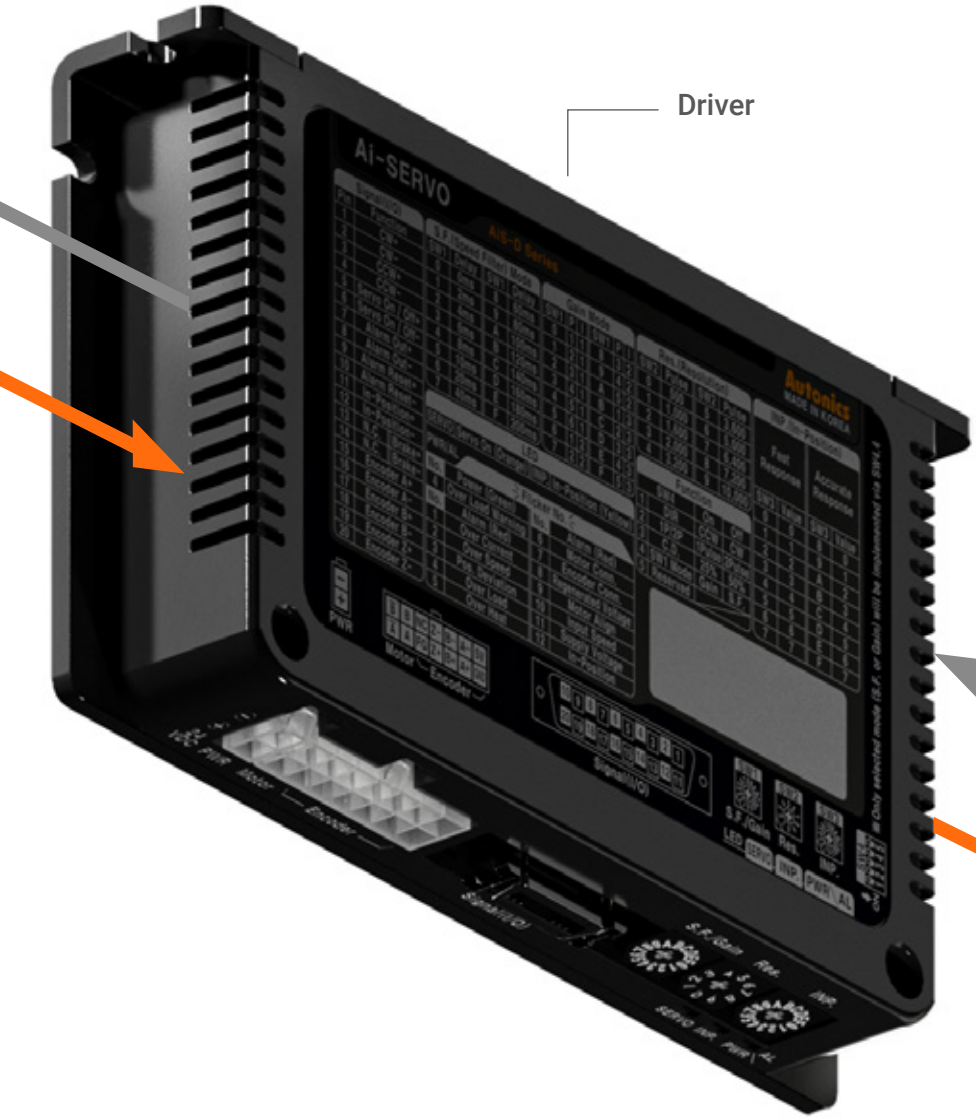


Micro Vibration

4. High Speed and High Torque Drive

General stepper motors use motors with twice the load torque considering the safety margin. Meanwhile, Autonics closed loop stepper motor system demonstrates the high speed and high torque drive while controlling the current and maximizing the torque of motors without hunting.





1 Pulse (Input)

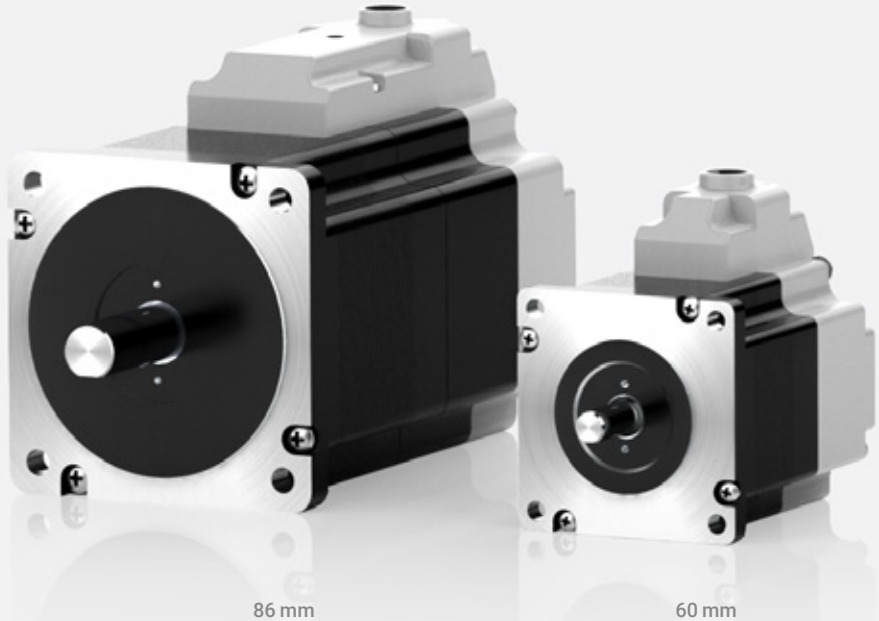
2 Current Control

3 Encoder Signals

4 Position Control and Alarm

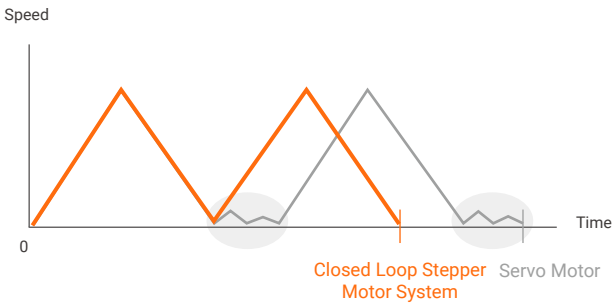
Controller

Pulse Input Type ▶



5. High Speed Position Control

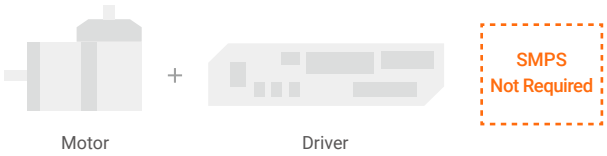
Closed loop stepper motor system, which offers excellent tracking performance and faster target positioning without hunting than a general servo system, is an ideal choice for short-pitch drive.



6. Various Lineup

6-1. AC / DC Power Input Model

AC power and DC power supply model are provided. AC power supply model can be used as an alternative to some servo motors.



6-2. Motor Type

Standard type, Built-in Brakes / Gear / Rotary actuator type are provided. Users can choose different motors in various environments.

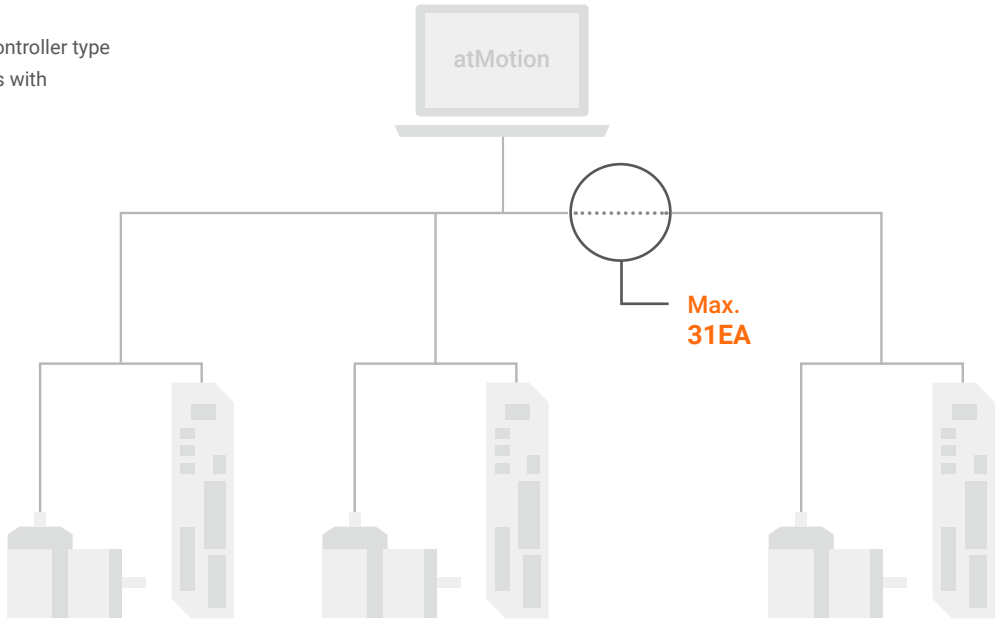
6-3. Motor Frame Size

20 mm, 28 mm, 35 mm, 42 mm, 56 mm, 60 mm, 86 mm frame sizes are provided.

Type			Model		Motor Type	Motor Frame Size						
						20 mm	28 mm	35 mm	42 mm	56 mm	60 mm	86 mm
Pulse Input Type		DC	AiS		Standard	○	○	○	○	○	○	
					Built-in Brakes				○	○	○	
					Built-in Gear				○		○	
					Built-in Rotary actuator						○	
		AC	AiSA		Standard						○	○
					Built-in Brakes						○	○
					Built-in Gear						○	○
					Built-in Rotary actuator						○	
Intergrated Controller Type	Modbus RTU	DC	AiC		Standard	○	○	○	○	○	○	
					Built-in Brakes				○	○	○	
					Built-in Gear				○		○	
					Built-in Rotary actuator						○	
		AC	AiCA		Standard						○	○
					Built-in Brakes						○	○
					Built-in Gear						○	○
					Built-in Rotary actuator						○	
	EtherCAT	DC	AiC-EC		Standard	○	○	○	○	○	○	
					Built-in Brakes				○	○	○	
					Built-in Gear				○		○	
					Built-in Rotary actuator						○	
		AC	AiCA-EC		Standard						○	○
					Built-in Brakes						○	○
					Built-in Gear						○	○
					Built-in Rotary actuator						○	
	CC-Link	DC	AiC-CL		Standard	○	○	○	○	○	○	
					Built-in Brakes				○	○	○	
					Built-in Gear				○		○	
					Built-in Rotary actuator						○	

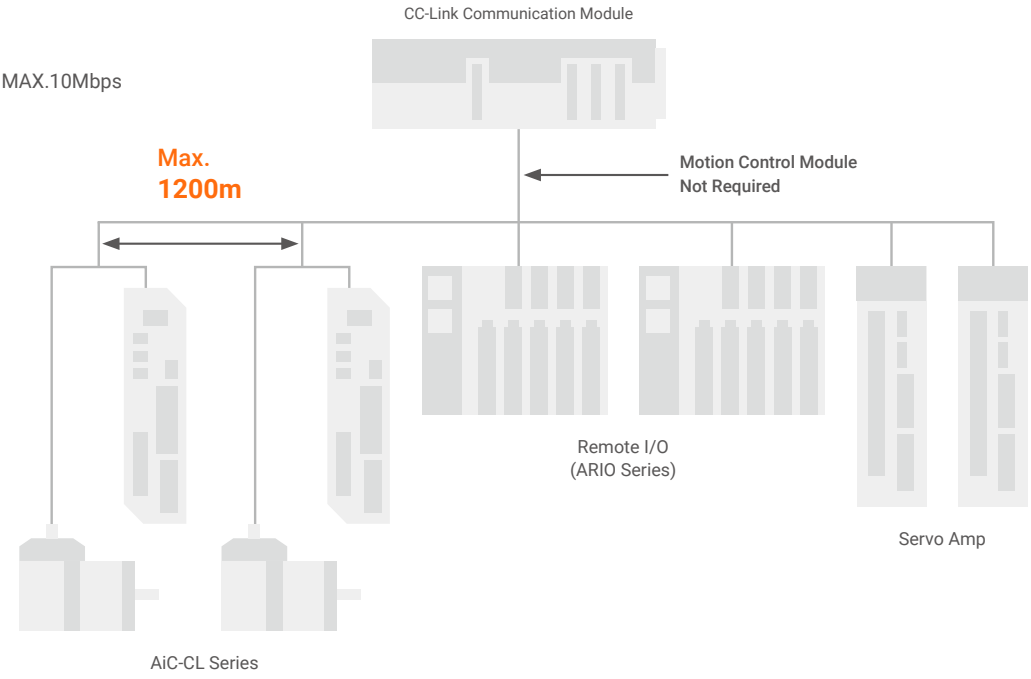
Modbus

· Control up to 31 axes
· Motor driver + integrated controller type
· Control multiple motor axes with RS485 Communication

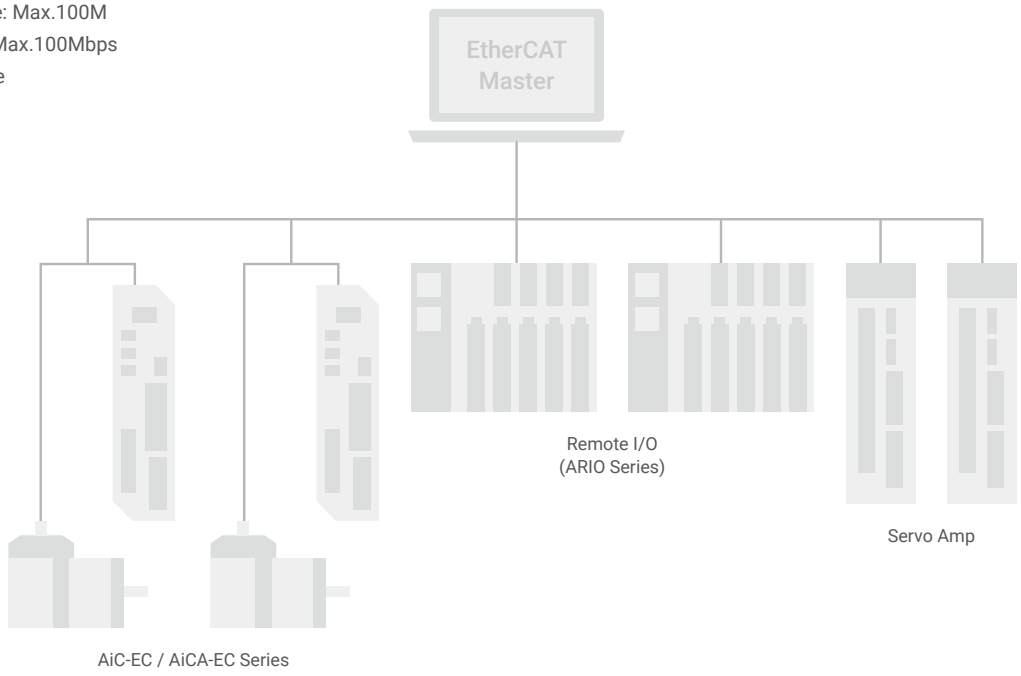


CC-Link

· Control up to 42 axes
· Communication speed: MAX.10Mbps



· Communication distance: Max.100M
· Communication speed: Max.100Mbps
· Node: Max.65,535 Device



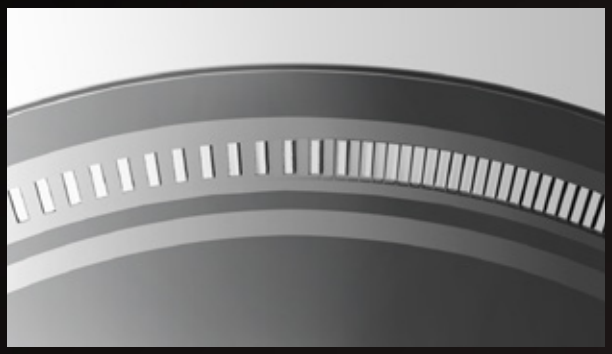
6-4. Integrated Controllers with Various Protocols Available

Various integrated controller types with Modbus RTU communication, CC-Link communication and EtherCAT communication are supported. For Modbus RTU communication, 31 axes can be connected and controlled with RS485. For CC-Link communication, control is available without motion modules or controllers under the Mitsubishi PLC control environment. Users can control up to 42 axes. For EtherCAT communication, it can control motion of multiple axes simultaneously with 100 Mbps communication speed. It ensures compatibility with various masters through the test by ETG Association.

7. Motion Control Optimization

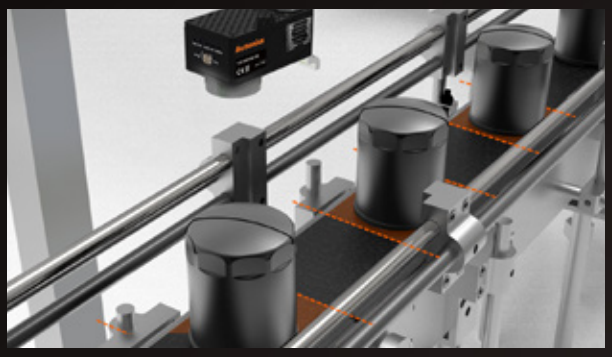
7-1. Tuning with the External Switch (Pulse Input Type)

Users can set operation setting easily with external adjuster.
(Gain, speed filter, in-position, resolution)



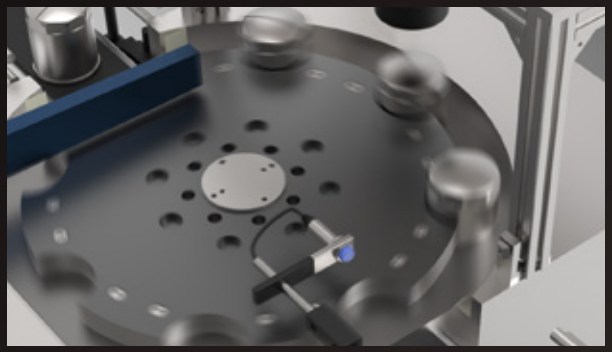
1 Speed Filter, Position Gain Setting

Users can minimize vibration and noise by changing the settings for speed filter and position gain values.



2 In-Position Setting

Operation speed and accuracy setting is possible by changing the position set range.

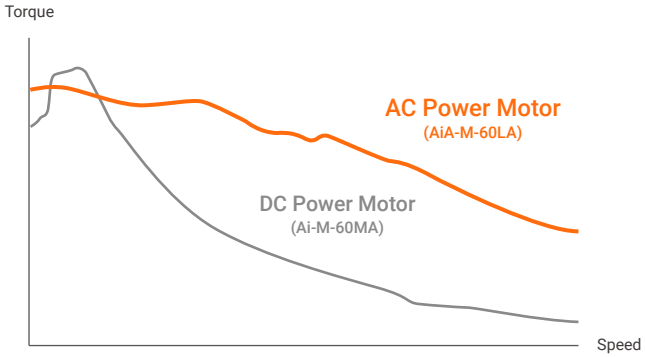


3 Resolution Setting

Operation precision setting is possible by changing the resolution between 500 and 10,000.

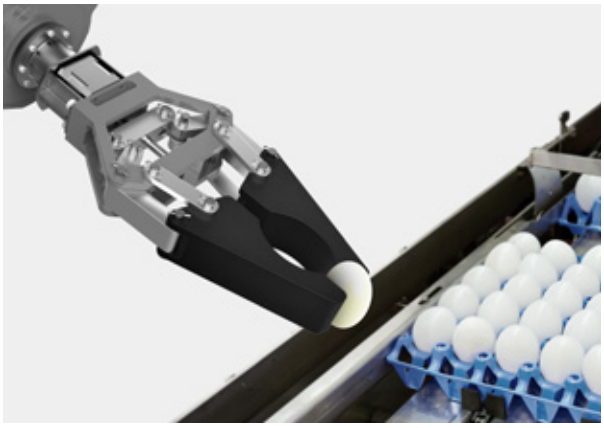
7-2. High Torque Drive Control (AC model)

AC power supply closed loop stepper motor system can maintain higher torque during high speed drive compared to DC type motors and be applied to machinery required big power.



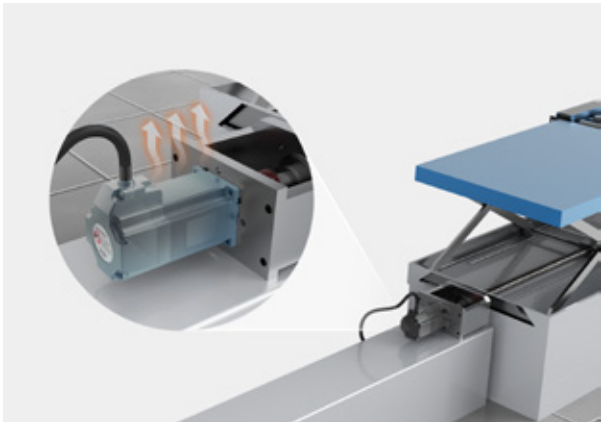
7-3. Torque Control Mode (AC model)

Torque control mode allows accurate operation of machinery by maintaining the initial torque set during motor operation.



7-4. Auto Current Down Mode (AC model)

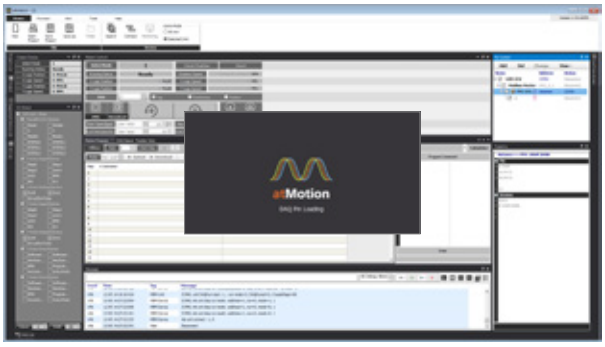
Auto current down mode reduces the electric current when the motor stops (no load) to minimize heat generation.



7-5. atMotion, Motion Control Software

atMotion is a comprehensive motion control management software for managing Autonics motion devices. Connecting the drivers allows users to easily configure parameters and monitoring, and operation test.

* For details, refer to page 76



Pulse Input Type DC Power
2-Phase Closed Loop Stepper Motor System

AiS Series

* Refer to p.30~34 for motor information
(model, specifications, dimension, torque characteristics)

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

AiS	-	D	-	❶	❷	❸	-	❹

❶ Frame size
Number: Frame size (Unit: mm)

❸ Encoder resolution

	☐ 20 / 28 / 35 mm	☐ 42 / 56 / 60 mm
A	4,000 PPR (1,000 PPR × 4)	10,000 PPR (2,500 PPR × 4)
B	16,000 PPR (4,000 PPR × 4)	-

❷ Axial length
S: Short
M: Medium
L: Long

❹ Motor type
No mark: Standard type
B: Built-in brake type

Set Composition

Standard Type

Motor frame size	Set	Driver	Motor
☐ 20 mm	AiS-20MA	AiS-D-20MA	Ai-M-20MA
	AiS-20LA	AiS-D-20LA	Ai-M-20LA
☐ 28 mm ☐ 35 mm	AiS-☐SB	AiS-D-☐SB	Ai-M-☐SB
	AiS-☐MB	AiS-D-☐MB	Ai-M-☐MB
	AiS-☐LB	AiS-D-☐LB	Ai-M-☐LB
☐ 42 mm ☐ 56 mm ☐ 60 mm	AiS-☐SA	AiS-D-☐SA	Ai-M-☐SA
	AiS-☐MA	AiS-D-☐MA	Ai-M-☐MA
	AiS-☐LA	AiS-D-☐LA	Ai-M-☐LA

Built-in Brake Type

Motor frame size	Set	Driver	Motor
☐ 42 mm ☐ 56 mm ☐ 60 mm	AiS-☐SA-B	AiS-D-☐SA-B	Ai-M-☐SA-B
			Ai-M-☐MA-B
			Ai-M-☐LA-B

Built-in Gear Type

Motor frame size	Set	Driver	Motor
☐ 42 mm ☐ 56 mm	-	AiS-D-☐MA	Ai-M-☐MA-G5
			Ai-M-☐MAG7.2
			Ai-M-☐MAG10

Built-in Rotary Actuator Type

Motor frame size	Set	Driver	Motor
☐ 60 mm	-	AiS-D-60MA	Ai-M-60MA-R5
			Ai-M-60MA-R7.2
			Ai-M-60MA-R10

The built-in gear type and rotary actuator type motors are not provided as a separate set.
Please purchase a motor/driver separately. Refer to each instruction manual for details.

Specifications

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		

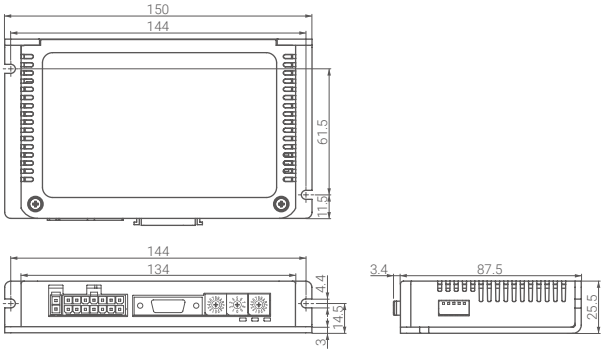
01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.
02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%. The value in the bracket indicates builtin brake type.
03) RUN current varies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

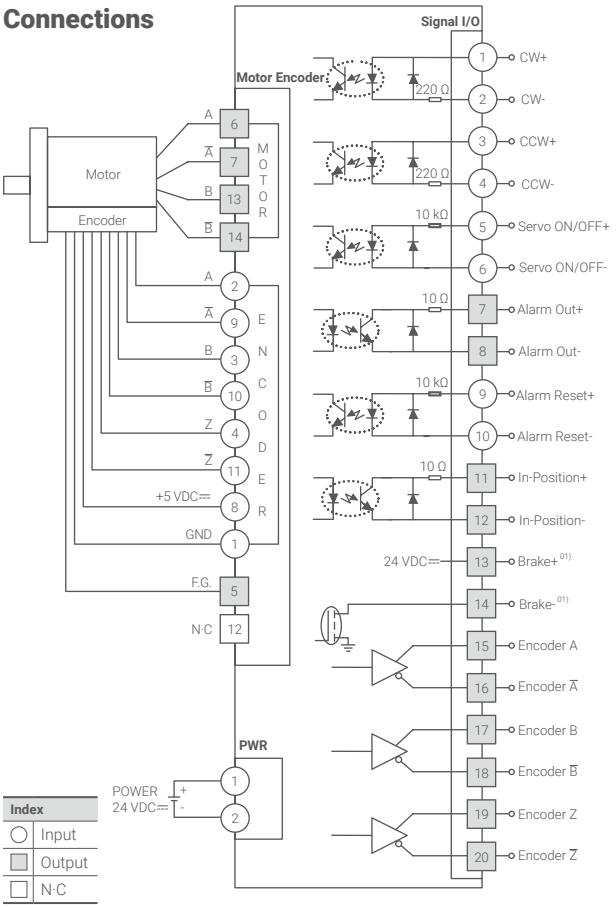
Input resistance	220 Ω (CW, CCW), 10 kΩ (Servo ON/OFF, Alarm Reset)
Insulation resistance	≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength	1,000 VAC~ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s2 (≈ 30 G) 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)

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

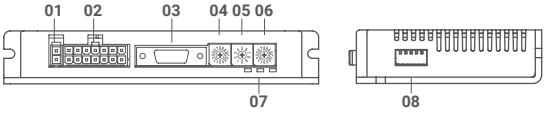


Connections



01) The corresponding pin is N·C in standard type.

Unit Descriptions



01. Power connector
02. Motor + Encoder connector
03. I/O connector
04. Speed filter / Control Gain setting rotary switch
05. Resolution setting rotary switch
06. In-Position setting rotary switch
07. Status indicator
08. Function selection DIP switch

Sold Separately

[Power Cable]
CJ-PW-☐

[Motor + Encoder Cable]
Fixed type: C1D14M-☐, Flexible type: C1DF14M-☐

[I/O Cable]
CO20-MP☐-R (specifications: AiS TAG)

* Refer to p.78 for information on separately sold items

Pulse Input Type AC Power
2-Phase Closed Loop Stepper Motor System

AiSA Series

* Refer to p.36~38 for motor information
(model, specifications, dimension, torque characteristics)

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

AiSA	-	D	-	❶	❷	A	-	❸

❶ Frame size
Number: Frame size (mm)

❷ Axial length
M: Medium
L: Long

❸ Motor type
No mark: Standard type
B: Built-in brake type

Set Composition

Standard Type

Motor frame size	Set	Driver	Motor
□ 60 mm	AiSA-60MA	AiSA-D-60MA	AiA-M-60MA
	AiSA-60LA	AiSA-D-60LA	AiA-M-60LA
□ 86 mm	AiSA-86MA	AiSA-D-86MA	AiA-M-86MA
	AiSA-86LA	AiSA-D-86LA	AiA-M-86LA

Built-in Brake Type

Motor frame size	Set	Driver	Motor
□ 60 mm	AiSA-60MA-B	AiSA-D-60MA-B	AiA-M-60MA-B
	AiSA-60LA-B	AiSA-D-60LA-B	AiA-M-60LA-B
□ 86 mm	AiSA-86MA-B	AiSA-D-86MA-B	AiA-M-86MA-B
	AiSA-86LA-B	AiSA-D-86LA-B	AiA-M-86LA-B

Specifications

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			

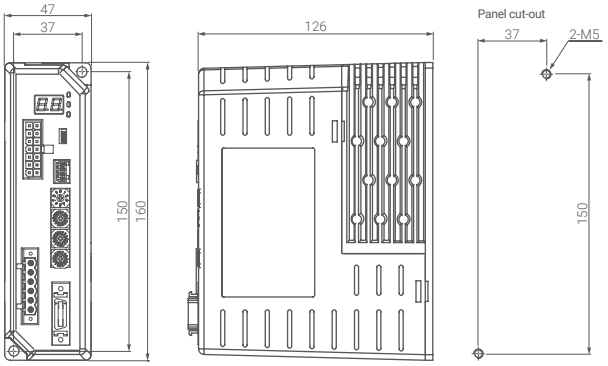
01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.
02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%
03) Auxiliary power is only available in built-in brake type and not available 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
Max. rotation speed	3000 rpm
Control Gain	Standard Gain: 0 to F, Inertia Gain: 0 to F
In-Position	Fast Response: 0 (factory default) ~ 7, Accurate Response: 0 ~ 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, A, B, B, Z, 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

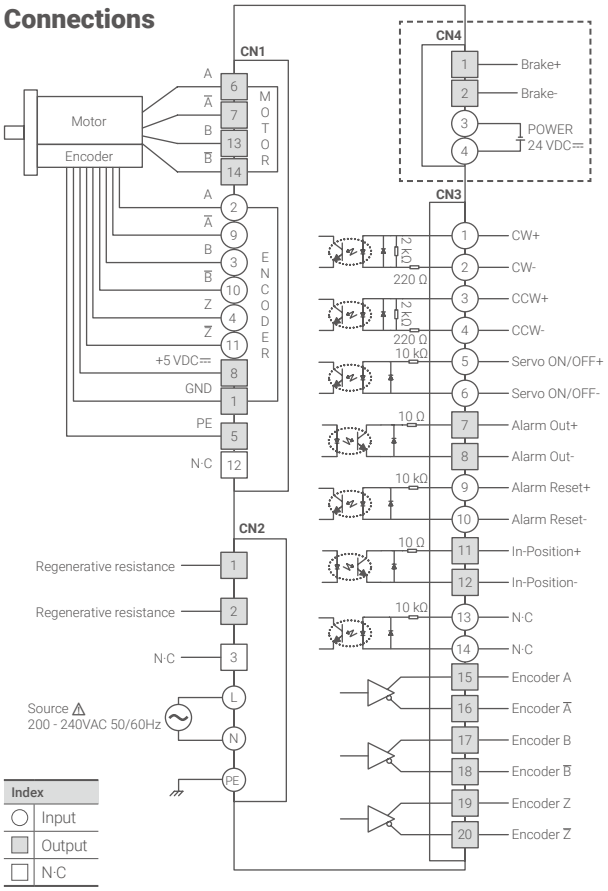
Input resistance	4.7 kΩ (Anode Pull-Up)
Insulation resistance	≥ 200 MΩ (500 VDC⎓ megger)
Dielectric strength	1,500 VAC~ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s2 (≈ 30 G) in each X, Y, Z direction 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: 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)

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

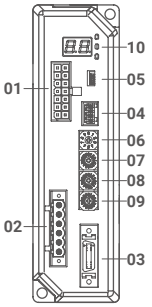


Connections



• ⬚ is only available in built-in brake type.

Unit Descriptions



01. Motor + Encoder connector
02. Power connector
03. I/O connector
04. Brake connector
05. Function selection DIP switch
06. Resolution setting rotary Switch
07. Control Gain setting rotary switch
08. Speed filter / Speed limit setting rotary switch
09. In-Position setting rotary switch
10. Status display part / indicators

Sold Separately

[Motor + Encoder Cable]
Fixed type: C1D14M-□, Flexible type: C1DF14M-□

[I/O Cable]
CO20-MP□-R (specifications: AiS TAG)

* Refer to p.78 for information on separately sold items

Integrated Controller Type DC Power

2-Phase Closed Loop Stepper Motor System

(Modbus RTU Communication)

AiC Series

* Refer to p.30~34 for motor information
(model, specifications, dimension, torque characteristics)

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

AiC	-	D	-	❶	❷	❸	-	❹

❶ Frame size

Number: Frame size (Unit: mm)

❸ Encoder resolution

	□ 20 / 28 / 35 mm	□ 42 / 56 / 60 mm
A	4,000 PPR (1,000 PPR × 4)	10,000 PPR (2,500 PPR × 4)
B	16,000 PPR (4,000 PPR × 4)	-

❷ Axial length

S: Short
M: Medium
L: Long

❹ Motor type

No mark: Standard type
B: Built-in brake type

Set Composition

Standard Type

Motor frame size	Set	Driver	Motor
□ 20 mm	AiC-20MA	AiC-D-20MA	Ai-M-20MA
	AiC-20LA	AiC-D-20LA	Ai-M-20LA
□ 28 mm	AiC-28SB	AiC-D-28SB	Ai-M-28SB
	AiC-28MB	AiC-D-28MB	Ai-M-28MB
	AiC-28LB	AiC-D-28LB	Ai-M-28LB
□ 35 mm	AiC-35SB	AiC-D-35SB	Ai-M-35SB
	AiC-35MB	AiC-D-35MB	Ai-M-35MB
	AiC-35LB	AiC-D-35LB	Ai-M-35LB
□ 42 mm	AiC-42SA	AiC-D-42SA	Ai-M-42SA
	AiC-42MA	AiC-D-42MA	Ai-M-42MA
	AiC-42LA	AiC-D-42LA	Ai-M-42LA
□ 56 mm	AiC-56SA	AiC-D-56SA	Ai-M-56SA
	AiC-56MA	AiC-D-56MA	Ai-M-56MA
	AiC-56LA	AiC-D-56LA	Ai-M-56LA
□ 60 mm	AiC-60SA	AiC-D-60SA	Ai-M-60SA
	AiC-60MA	AiC-D-60MA	Ai-M-60MA
	AiC-60LA	AiC-D-60LA	Ai-M-60LA

Built-in Brake Type

Motor frame size	Set	Driver	Motor
□ 42 mm	AiC-42SA-B	AiC-D-42SA-B	Ai-M-42SA-B
	AiC-42MA-B	AiC-D-42MA-B	Ai-M-42MA-B
	AiC-42LA-B	AiC-D-42LA-B	Ai-M-42LA-B
□ 56 mm	AiC-56SA-B	AiC-D-56SA-B	Ai-M-56SA-B
	AiC-56MA-B	AiC-D-56MA-B	Ai-M-56MA-B
	AiC-56LA-B	AiC-D-56LA-B	Ai-M-56LA-B
□ 60 mm	AiC-60SA-B	AiC-D-60SA-B	Ai-M-60SA-B
	AiC-60MA-B	AiC-D-60MA-B	Ai-M-60MA-B
	AiC-60LA-B	AiC-D-60LA-B	Ai-M-60LA-B

Built-in Gear Type

Motor frame size	Set	Driver	Motor
□ 42 mm	-	AiC-D-42MA	Ai-M-42MA-G5
			Ai-M-42MA-G7.2
			Ai-M-42MA-G10
□ 60 mm	-	AiC-D-60MA	Ai-M-60MA-G5
			Ai-M-60MA-G7.2
			Ai-M-60MA-G10

Built-in Rotary Actuator Type

Motor frame size	Set	Driver	Motor
□ 60 mm	-	AiC-D-60MA	Ai-M-60MA-R5
			Ai-M-60MA-R7.2
			Ai-M-60MA-R10

The built-in gear type and rotary actuator type motors are not provided as a separate set. Please purchase a motor/driver separately. Refer to each instruction manual for details.

Specifications

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		

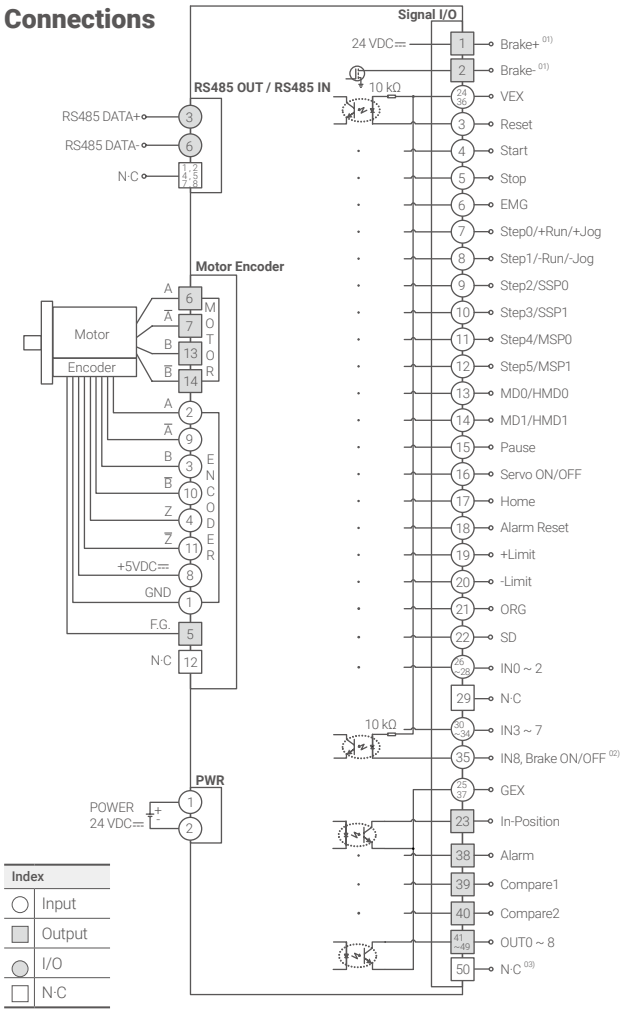
01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.
02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%
03) RUN current varies depending on the input RUN frequency and max. RUN current 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 (afctory 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 ~ +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, General output: 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/s2 (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50℃, storage: -10 to 60℃ (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)

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

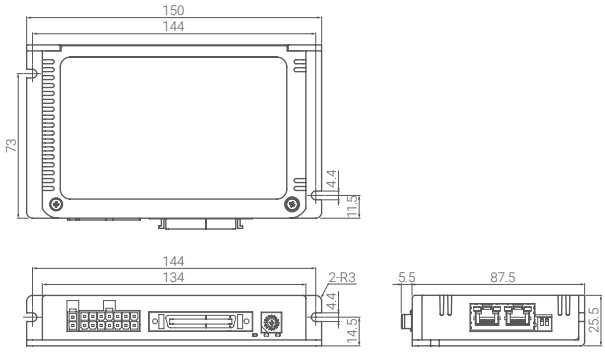
Connections



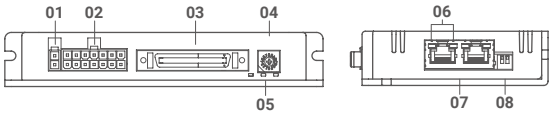
01) The corresponding pin is N·C in standard type.
02) Brake ON/OFF function is available in built-in brake type.
03) The corresponding pin is OUT9 in standard type.

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.



Unit Descriptions



01. Power connector
02. Motor + Encoder connector
03. I/O connector
04. Comm. ID setting rotary switch
05. Status indicator
06. RS485 comm. indicator
07. RS485 comm. connector
08. Comm. ID setting / Terminating resistance DIP switch

Sold Separately

[Power Cable]
CJ-PW-□

[Motor + Encoder Cable]
Fixed type: C1D14M-□, Flexible type: C1DF14M-□

[I/O Cable]
CO50-MP□-R (specifications: AiC TAG)

* Refer to p.78 for information on separately sold items

Integrated Controller Type AC Power

2-Phase Closed Loop Stepper Motor System

(Modbus RTU Communication)

AiCA Series

* Refer to p.36~38 for motor information
(model, specifications, dimension, torque characteristics)

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

AiCA	-	D	-	❶	❷	A	-	❸

❶ Frame size
Number: Frame size (Unit: mm)

❷ Axial length
M: Medium
L: Long

❸ Motor type
No mark: Standard type
B: Built-in brake type

Set Composition

Standard Type

Motor frame size	Set	Driver	Motor
□ 60 mm	AiCA-60MA	AiCA-D-60MA	AiA-M-60MA
	AiCA-60LA	AiCA-D-60LA	AiA-M-60LA
□ 86 mm	AiCA-86MA	AiCA-D-86MA	AiA-M-86MA
	AiCA-86LA	AiCA-D-86LA	AiA-M-86LA

Built-in Brake Type

Motor frame size	Set	Driver	Motor
□ 60 mm	AiCA-60MA-B	AiCA-D-60MA-B	AiA-M-60MA-B
	AiCA-60LA-B	AiCA-D-60LA-B	AiA-M-60LA-B
□ 86 mm	AiCA-86MA-B	AiCA-D-86MA-B	AiA-M-86MA-B
	AiCA-86LA-B	AiCA-D-86LA-B	AiA-M-86LA-B

Built-in Gear Type

Motor frame size	Set	Driver	Motor
□ 60 mm	-	AiCA-D-60LA	AiA-M-60LA-G5
			AiA-M-60LA-G7.2
			AiA-M-60LA-G10
□ 86 mm	-	AiCA-D-86LA	AiA-M-86LA-G5
			AiA-M-86LA-G7.2
			AiA-M-86LA-G10

The built-in gear type and rotary actuator type motors are not provided as a separate set.
Please purchase a motor/driver separately. Refer to each instruction manual for details.

Built-in Rotary Actuator Type

Motor frame size	Set	Driver	Motor
□ 60 mm	-	AiCA-D-60LA	AiA-M-60LA-R5
			AiA-M-60LA-R7.2
			AiA-M-60LA-R10

Specifications

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 ~ +2,147,483,647
In-Position	Fast Response: 0 (factory default) ~ 7, Accurate Response: 0 ~ 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/s2 (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50℃, storage: -10 to 60℃ (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)

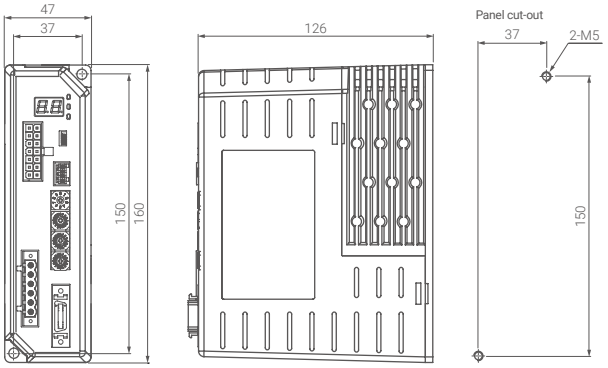
01) Brake ON/OFF function can be changed from general input IN8 in case of built-in brake type.

Communication Interface - RS485

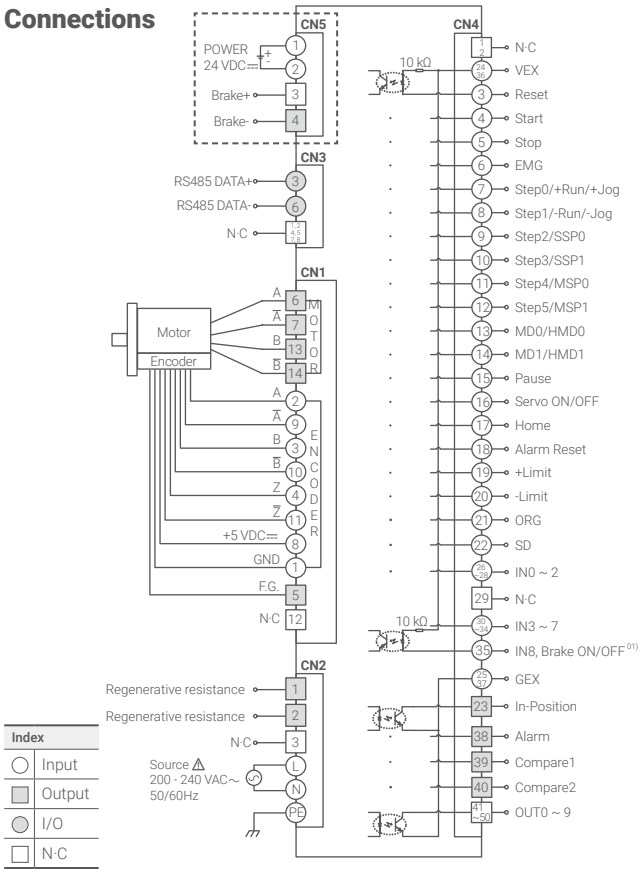
Comm. protocol	Modbus RTU
Applied standard	Compliance with EIA RS485
Max. connections	31 units (address: 01 to 31)
Synchronous method	Asynchronous
Comm. method	2-wire half duplex
Comm. distance	≤ 800 m
Baud rate	9600, 19200, 38400, 57600, 115200 (factory default) bps
Start bit	1 bit (fixed)
Data bit	8 bit (fixed)
Parity bit	None (factory default), Even, Odd
Stop bit	1 bit (factory default), 2 bit

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

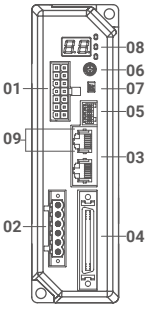


Connections



01) Brake ON/OFF function is available in built-in brake type.
• ⬚ is only available in built-in brake type.

Unit Descriptions



01. Motor + Encoder connector
02. Power connector
03. Communication connector
04. I/O connector
05. Brake connector
06. Comm. ID setting rotary switch
07. Comm. ID setting / Terminating resistance DIP switch
08. Status display part / indicators
09. RS485 comm. indicator

Sold Separately

[Motor + Encoder Cable]
Fixed type: C1D14M-□, Flexible type: C1DF14M-□

[I/O Cable]
CO50-MP□-R (specifications: AiC TAG)

* Refer to p.78 for information on separately sold items

Integrated Controller Type DC Power

2-Phase Closed Loop Stepper Motor System

(EtherCAT Communication)

AiC-EC Series

* Refer to p.30~34 for motor information
(model, specifications, dimension, torque characteristics)

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

AiC	-	D	-	❶	❷	❸	-	❹	-	EC

❶ Frame size
Number: Frame size (mm)

❸ Encoder resolution

	□ 20 / 28 / 35 mm	□ 42 / 56 / 60 mm
A	4,000 PPR (1,000 PPR × 4)	10,000 PPR (2,500 PPR × 4)
B	16,000 PPR (4,000 PPR × 4)	-

❷ Axial length
S: Short
M: Medium
L: Long

❹ Motor type
No mark: Standard type
B: Built-in brake type

Set Composition

Standard Type

Motor frame size	Set	Driver	Motor
□ 20 mm	AiC-20MA-EC	AiC-D-20MA-EC	Ai-M-20MA
	AiC-20LA-EC	AiC-D-20LA-EC	Ai-M-20LA
□ 28 mm	AiC-28SB-EC	AiC-D-28SB-EC	Ai-M-28SB
	AiC-28MB-EC	AiC-D-28MB-EC	Ai-M-28MB
	AiC-28LB-EC	AiC-D-28LB-EC	Ai-M-28LB
□ 35 mm	AiC-35SB-EC	AiC-D-35SB-EC	Ai-M-35SB
	AiC-35MB-EC	AiC-D-35MB-EC	Ai-M-35MB
	AiC-35LB-EC	AiC-D-35LB-EC	Ai-M-35LB
□ 42 mm	AiC-42SA-EC	AiC-D-42SA-EC	Ai-M-42SA
	AiC-42MA-EC	AiC-D-42MA-EC	Ai-M-42MA
	AiC-42LA-EC	AiC-D-42LA-EC	Ai-M-42LA
□ 56 mm	AiC-56SA-EC	AiC-D-56SA-EC	Ai-M-56SA
	AiC-56MA-EC	AiC-D-56MA-EC	Ai-M-56MA
	AiC-56LA-EC	AiC-D-56LA-EC	Ai-M-56LA
□ 60 mm	AiC-60SA-EC	AiC-D-60SA-EC	Ai-M-60SA
	AiC-60MA-EC	AiC-D-60MA-EC	Ai-M-60MA
	AiC-60LA-EC	AiC-D-60LA-EC	Ai-M-60LA

Built-in Brake Type

Motor frame size	Set	Driver	Motor
□ 42 mm	AiC-42SA-B-EC	AiC-D-42SA-B-EC	Ai-M-42SA-B
	AiC-42MA-B-EC	AiC-D-42MA-B-EC	Ai-M-42MA-B
	AiC-42LA-B-EC	AiC-D-42LA-B-EC	Ai-M-42LA-B
□ 56 mm	AiC-56SA-B-EC	AiC-D-56SA-B-EC	Ai-M-56SA-B
	AiC-56MA-B-EC	AiC-D-56MA-B-EC	Ai-M-56MA-B
	AiC-56LA-B-EC	AiC-D-56LA-B-EC	Ai-M-56LA-B
□ 60 mm	AiC-60SA-B-EC	AiC-D-60SA-B-EC	Ai-M-60SA-B
	AiC-60MA-B-EC	AiC-D-60MA-B-EC	Ai-M-60MA-B
	AiC-60LA-B-EC	AiC-D-60LA-B-EC	Ai-M-60LA-B

Built-in Gear Type

Motor frame size	Set	Driver	Motor
□ 42 mm	-	AiC-D-42MA-EC	Ai-M-42MA-G5
			Ai-M-42MA-G7.2
			Ai-M-42MA-G10
□ 60 mm	-	AiC-D-60MA-EC	Ai-M-60MA-G5
			Ai-M-60MA-G7.2
			Ai-M-60MA-G10

Built-in Rotary Actuator Type

Motor frame size	Set	Driver	Motor
□ 60 mm	-	AiC-D-60MA-EC	Ai-M-60MA-R5
			Ai-M-60MA-R7.2
			Ai-M-60MA-R10

The built-in gear type and rotary actuator type motors are not provided as a separate set. Please purchase a motor/driver separately. Refer to each instruction manual for details.

Specifications

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 a(fctory 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 a(fctory 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) ~ 7, Accurate Response: 0 ~ 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

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/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: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Approval	CE KC RoHS
Unit weight (packaged)	≈ 350 g (≈ 500 g)

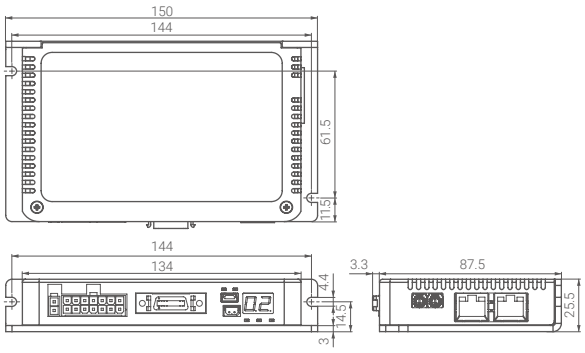
Communication Interface - EtherCAT

Comm. specifications	EtherCAT
Association approval 01)	EtherCAT Conformance tested
Support protocol	CoE (support CiA402 profile)
Physical layer	100BASE-TX (IEEE802.3)
Connection cable	CAT5e class or over (Shield type: SF/FTP, S/FTP, SF/UTP)
Max. comm. distance	Within 100 m distance between nodes
Baud rate	10 / 100 Mbps
Distributed clock	DC cycle: 250 us, 500 us, 1 ms, 2 ms, 4 ms
Node ID setting	ECAT ID switch setting: 1 to 99 Physical address setting at Master: 1 to 65535
Topology	Star, Line, Tree

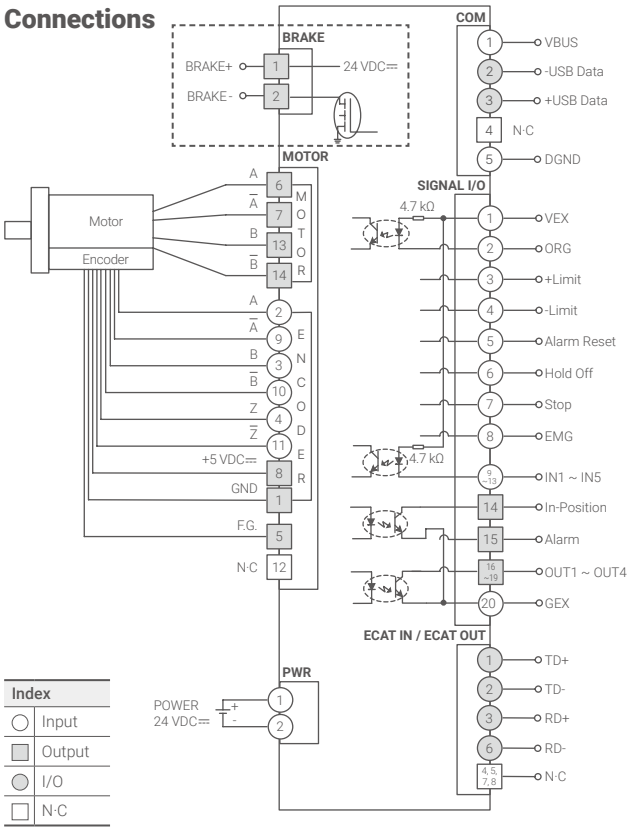
01) EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

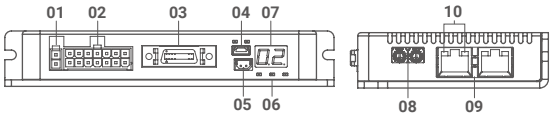


Connections



• ⬚ is only available in built-in brake type.

Unit Descriptions



01. Power connector
02. Motor + Encoder connector
03. I/O connector
04. USB connector
05. Brake connector(AiC-D-B-EC Series)
06. Status indicators
07. Status display part
08. Comm. ID setting rotary switch
09. Comm. connector
10. Comm. indicator

Sold Separately

[Power Cable]
CJ-PW-□

[Motor + Encoder Cable]
Fixed type: C1D14M-□, Flexible type: C1DF14M-□

[I/O Cable]
CO20-MP□-R (Specifications: AiC-EC TAG)

* Refer to p.78 for information on separately sold items

Integrated Controller Type AC Power

2-Phase Closed Loop Stepper Motor System

(EtherCAT Communication)

AiCA-EC Series

* Refer to p.36~38 for motor information
(model, specifications, dimension, torque characteristics)

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

AiCA	-	D	-	❶	❷	A	-	❸	-	EC

❶ Frame size
Number: Frame size (mm)

❷ Axial length
M: Medium
L: Long

❸ Motor type
No mark: Standard type
B: Built-in brake type

Set Composition

Standard Type

Motor frame size	Set	Driver	Motor
☐ 60 mm	AiCA-60MA-EC	AiCA-D-60MA-EC	AiA-M-60MA
	AiCA-60LA-EC	AiCA-D-60LA-EC	AiA-M-60LA
☐ 86 mm	AiCA-86MA-EC	AiCA-D-86MA-EC	AiA-M-86MA
	AiCA-86LA-EC	AiCA-D-86LA-EC	AiA-M-86LA

Built-in Brake Type

Motor frame size	Set	Driver	Motor
☐ 60 mm	AiCA-60MA-B-EC	AiCA-D-60MA-B-EC	AiA-M-60MA-B
	AiCA-60LA-B-EC	AiCA-D-60LA-B-EC	AiA-M-60LA-B
☐ 86 mm	AiCA-86MA-B-EC	AiCA-D-86MA-B-EC	AiA-M-86MA-B
	AiCA-86LA-B-EC	AiCA-D-86LA-B-EC	AiA-M-86LA-B

Built-in Gear Type

Motor frame size	Set	Driver	Motor
☐ 60 mm	-	AiCA-D-60LA-EC	AiA-M-60LA-G5
			AiA-M-60LA-G7.2
			AiA-M-60LA-G10
☐ 86 mm	-	AiCA-D-86LA-EC	AiA-M-86LA-G5
			AiA-M-86LA-G7.2
			AiA-M-86LA-G10

Built-in Rotary Actuator Type

Motor frame size	Set	Driver	Motor
☐ 60 mm	-	AiCA-D-60LA-EC	AiA-M-60LA-R5
			AiA-M-60LA-R7.2
			AiA-M-60LA-R10

The built-in gear type and rotary actuator type motors are not provided as a separate set. Please purchase a motor/driver separately. Refer to each instruction manual for details.

Specifications

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

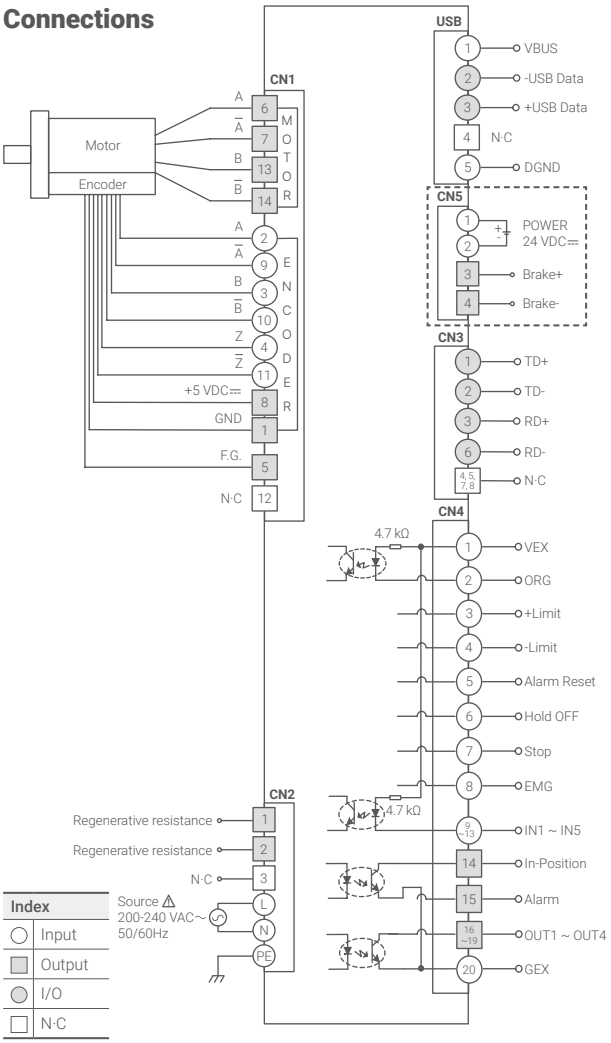
Input	Exclusive input: 7, General input: 5
Output	Exclusive output: 2 General output: 4
External power supply	VEX (Default: 24 VDC⎓), GEX (GND)
Input resistance	4.7 kΩ (Anode Pull-Up)
Insulation resistance	≥ 200 MΩ (500 VDC⎓ megger)
Dielectric strength	1,500 VAC~ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	300 m/s2 (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50℃, storage: -10 to 60℃ (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)

Communication Interface - EtherCAT

Comm. specifications	EtherCAT
Association approval [01)]	EtherCAT
Support protocol	CoE (support CiA402 profile), support FoE
Physical layer	100BASE-TX (IEEE802.3)
Connection cable	CAT5e class or over (Shield type: SF/FTP, S/FTP, SF/UTP)
Max. comm. distance	Within 100 m distance between nodes
Baud rate	10 / 100 Mbps
Distributed clock	DC cycle: 250 us, 500 us, 1 ms, 2 ms, 4 ms, 8 ms
Node ID setting	ECAT ID switch setting: 1 to 99 Physical address setting at Master: 1 to 65535
Topology	Star, Line, Tree

01) EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

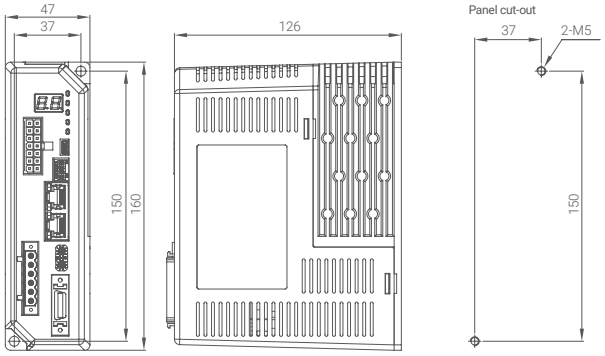
Connections



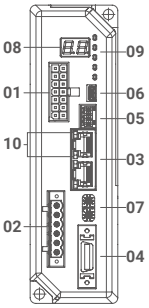
• ⬚ is only available in built-in brake type.

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.



Unit Descriptions



01. Motor + Encoder connector
02. Power connector
03. Comm. connector
04. I/O connector
05. Brake connector (AiCA-D-B-EC Series)
06. USB connector
07. Comm. ID setting rotary switch
08. Status display part
09. Status indicators
10. Comm. indicator

Sold Separately

[Motor + Encoder Cable]
Fixed type: C1D14M-□, Flexible type: C1DF14M-□

[I/O Cable]
CO20-MP□-R (Specifications: AiC-EC TAG)

* Refer to p.78 for information on separately sold items

Integrated Controller Type DC Power

2-Phase Closed Loop Stepper Motor System

(CC-Link Communication)

AiC-CL Series

* Refer to p.30~34 for motor information
(model, specifications, dimension, torque characteristics)

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

AiC	-	D	-	❶	❷	❸	-	❹	-	CL

❶ Frame size
Number: Frame size (unit: mm)

❸ Encoder resolution

	☐ 20 / 28 / 35 mm	☐ 42 / 56 / 60 mm
A	4,000 PPR (1,000 PPR × 4)	10,000 PPR (2,500 PPR × 4)
B	16,000 PPR (4,000 PPR × 4)	-

❷ Axial length
S: Short
M: Medium
L: Long

❹ Motor type
No mark: Standard type
B: Built-in brake type

Set Composition

Standard Type

Motor frame size	Set	Driver	Motor
☐ 20 mm	AiC-20MA-CL	AiC-D-20MA-CL	Ai-M-20MA
	AiC-20LA-CL	AiC-D-20LA-CL	Ai-M-20LA
☐ 28 mm	AiC-28SB-CL	AiC-D-28SB-CL	Ai-M-28SB
	AiC-28MB-CL	AiC-D-28MB-CL	Ai-M-28MB
	AiC-28LB-CL	AiC-D-28LB-CL	Ai-M-28LB
☐ 35 mm	AiC-35SB-CL	AiC-D-35SB-CL	Ai-M-35SB
	AiC-35MB-CL	AiC-D-35MB-CL	Ai-M-35MB
	AiC-35LB-CL	AiC-D-35LB-CL	Ai-M-35LB
☐ 42 mm	AiC-42SA-CL	AiC-D-42SA-CL	Ai-M-42SA
	AiC-42MA-CL	AiC-D-42MA-CL	Ai-M-42MA
	AiC-42LA-CL	AiC-D-42LA-CL	Ai-M-42LA
☐ 56 mm	AiC-56SA-CL	AiC-D-56SA-CL	Ai-M-56SA
	AiC-56MA-CL	AiC-D-56MA-CL	Ai-M-56MA
	AiC-56LA-CL	AiC-D-56LA-CL	Ai-M-56LA
☐ 60 mm	AiC-60SA-CL	AiC-D-60SA-CL	Ai-M-60SA
	AiC-60MA-CL	AiC-D-60MA-CL	Ai-M-60MA
	AiC-60LA-CL	AiC-D-60LA-CL	Ai-M-60LA

Built-in Brake Type

Motor frame size	Set	Driver	Motor
☐ 42 mm	AiC-42SA-B-CL	AiC-D-42SA-B-CL	Ai-M-42SA-B
	AiC-42MA-B-CL	AiC-D-42MA-B-CL	Ai-M-42MA-B
	AiC-42LA-B-CL	AiC-D-42LA-B-CL	Ai-M-42LA-B
☐ 56 mm	AiC-56SA-B-CL	AiC-D-56SA-B-CL	Ai-M-56SA-B
	AiC-56MA-B-CL	AiC-D-56MA-B-CL	Ai-M-56MA-B
	AiC-56LA-B-CL	AiC-D-56LA-B-CL	Ai-M-56LA-B
☐ 60 mm	AiC-60SA-B-CL	AiC-D-60SA-B-CL	Ai-M-60SA-B
	AiC-60MA-B-CL	AiC-D-60MA-B-CL	Ai-M-60MA-B
	AiC-60LA-B-CL	AiC-D-60LA-B-CL	Ai-M-60LA-B

Specifications

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 (afctory 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 ~ +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	Exclusive input: 3, General input: 8
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/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: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Approval	CE
Unit weight (packaged)	≈ 320 g (≈ 470 g)

Communication Interface - CC-Link

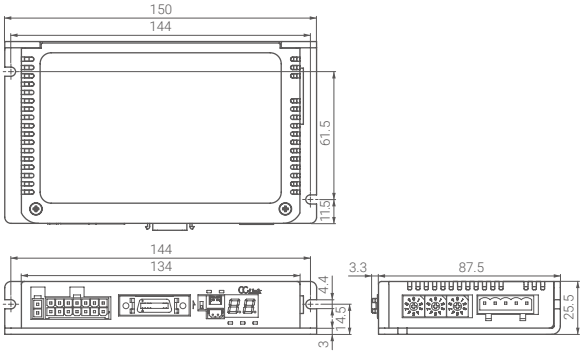
Comm. specifications	CC-Link Ver.1.10	
Association approval	CC-Link	
Station type	Remote device station	
Connection cable	CC-Link Exclusive Cable	
Baud rate	156 k, 625 k, 2.5 M, 5 M, 10 M bps	
Station number	01 to 64	
No. of occupied statio	1 station occupied, 2 stations occupied	
Comm. distance	Depending on baud rate	
Remote I/O	1 station occupied: Ryn / RXn 32 points each	2 stations occupied: Ryn / RXn 64 points each
Remote register	1 station occupied: RWrn / RWwn 4 points each	2 stations occupied: RWrn / RWwn 8 points each
Command code	Point table R/W, parameter R/W, read only, special command monitor only, network connection, drive control, motion control, drive status	
Comm. setting switch	10 bit rotary switch (0 to 9): 3, 1 bit DIP switch (ON / OFF)	

Communication Interface - RS485

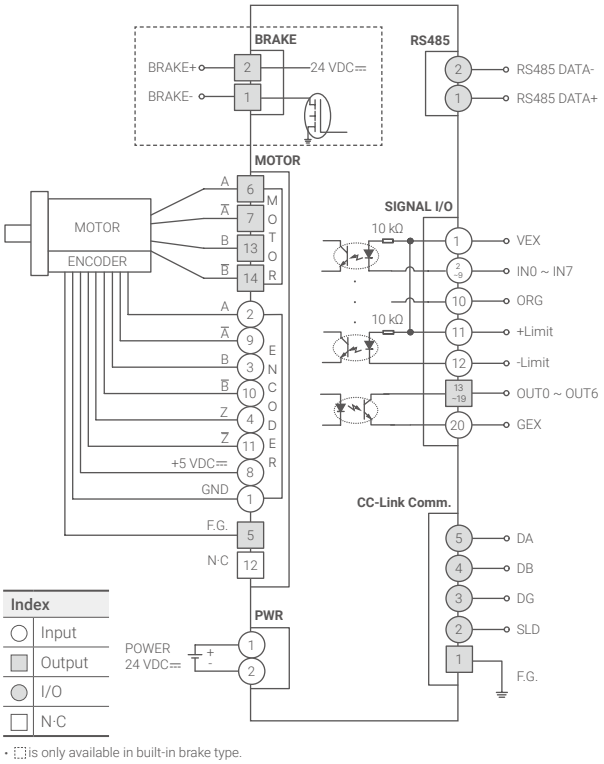
Comm. protocol	Modbus RTU
Applied standard	Compliance with EIA RS485
Max. connections	1 (fixed)
Baud rate	9600, 19200, 38400, 57600, 115200 (factory default) bps
Start bit	1 bit (fixed)
Data bit	8 bit (fixed)
Parity bit	None (fixed)
Stop bit	2 bit (fixed)

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

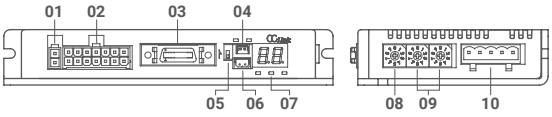


Connections



• ⬚ is only available in built-in brake type.

Unit Descriptions



01. Power connector
02. Motor + Encoder connector
03. I/O connector
04. RS485 comm. connector
05. CC-Link station setting DIP switch
06. Brake connector (AiC-D-B-CL Series)
07. Status display part / indicators
08. CC-Link comm. speed setting rotary switch
09. CC-Link comm. station setting rotary switch
10. CC-Link comm. connector

Sold Separately

[Power Cable]
CJ-PW-□

[Motor + Encoder Cable]
Fixed type: C1D14M-□, Flexible type: C1DF14M-□

[I/O Cable]
CO20-MP□-R (specifications: AiC-CL TAG)

* Refer to p.78 for information on separately sold items

Standard Type / Built-In Brake Type DC Power 2-Phase Closed Loop Stepper Motors

Ai-M Series

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

Ai	-	M	-	❶	❷	A	-	❸

❶ Frame size
Number: frame size (unit: mm)

❷ Axial length
S: Short
M: Medium
L: Long

❸ Motor type
No mark: standard type
B: built-in brake type

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 · m^2	54×10^{-7} kg · m^2	77×10^{-7} kg · m^2
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 · m^2	280×10^{-7} kg · m^2	480×10^{-7} kg · m^2
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 · m^2	490×10^{-7} kg · m^2	690×10^{-7} kg · m^2
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 $\frac{\text{Standard type}}{\text{Built-in brake type}}$

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: 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.

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	

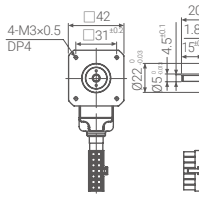
01) In order to reduce the heat generation of the built-in brake, the voltage drops from 24 VDC⎓ to 11.5 VDC⎓ to control.

Dimensions

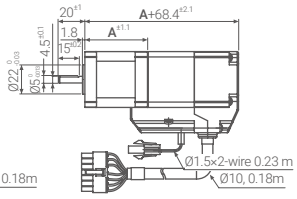
• Unit: mm, For the detailed drawings, follow the Autonics website.

■ ☐42mm

Standard type



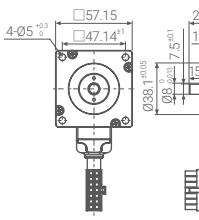
Built-in brake type



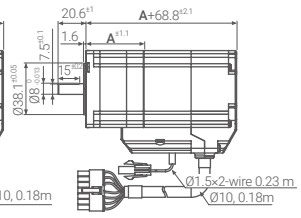
Axial length	S	M	L
A	34	40	48

■ ☐56mm

Standard type



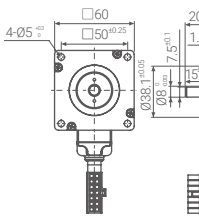
Built-in brake type



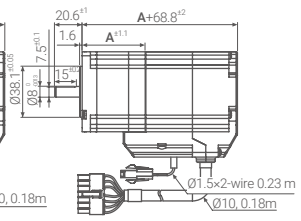
Axial length	S	M	L
A	43.4	56.4	77.4

■ ☐60mm

Standard type



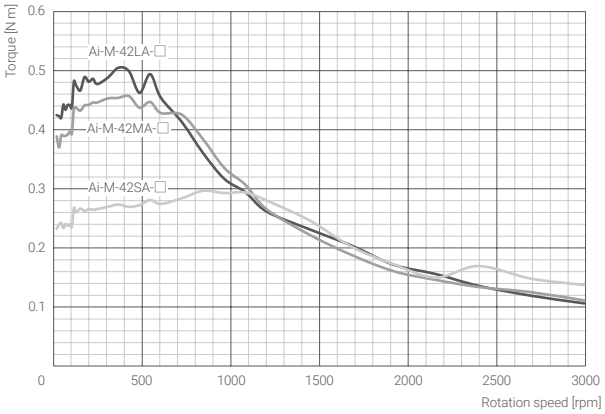
Built-in brake type



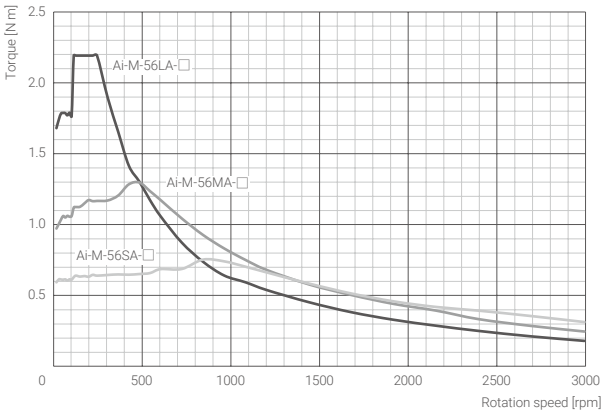
Axial length	S	M	L
A	48	68.9	85.9

Motor Characteristics

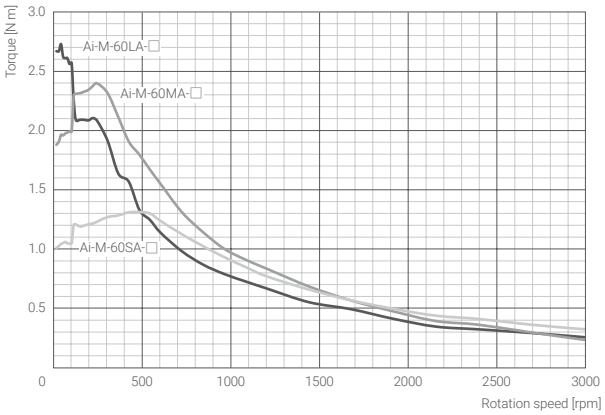
■ ☐42mm



■ ☐56mm



■ ☐60mm



Standard Type
DC Power
2-Phase Closed Loop Stepper Motors

Ai-M Series

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

Ai	-	M	-	❶	❷	❸

❶ Frame size
Number: Frame size (unit: mm)

❷ Axial length
S: Short
M: Medium
L: Long

❸ Motor type
A: 4,000 PPR (1,000 PPR × 4)
B: 16,000 PPR (4,000 PPR × 4)

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.

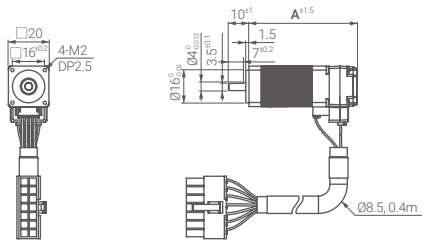
Encoder type	Incremental Rotary Encoder		
Frame size	☐ 20 mm	☐ 28 mm	☐ 35 mm
Power supply	5 VDC⎓ ± 5% (ripple P-P: ≤ 5%)		
Current consumption	≤ 50 mA (No load)		
Resolution	4,000 PPR (1,000 PPR × 4)	16,000 PPR (4,000 PPR × 4)	
Control output	Line driver Output		
Output phase	A, $\overline{A}$, B, $\overline{B}$, 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

Dimensions

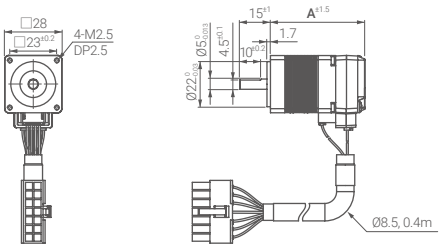
• Unit: mm, For the detailed drawings, follow the Autonics website.

■ □20mm



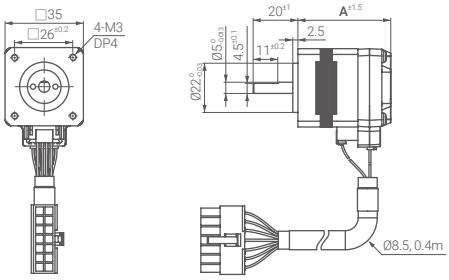
Axial length	M	L
A	41.2	53.1

■ □28mm



Axial length	S	M	L
A	46	59	65

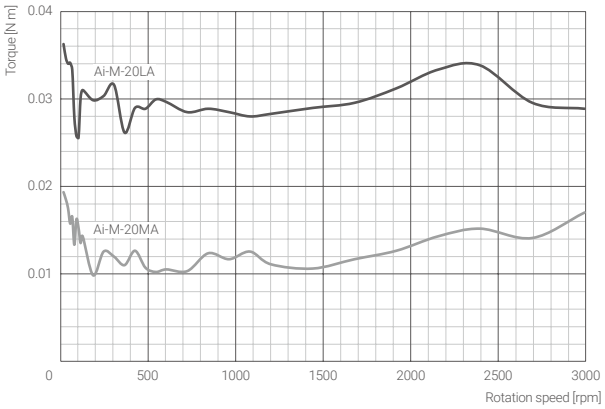
■ □35mm



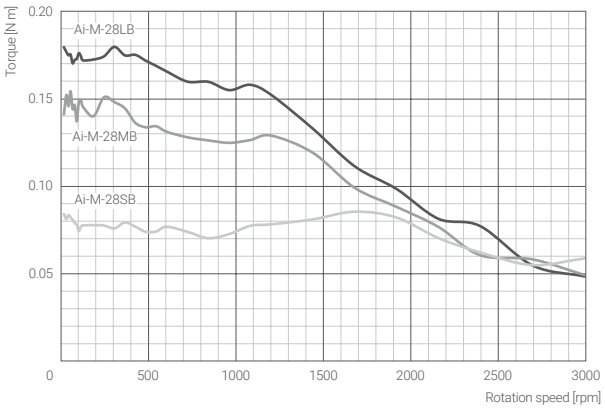
Axial length	S	M	L
A	41.5	52	68.5

Motor Characteristics

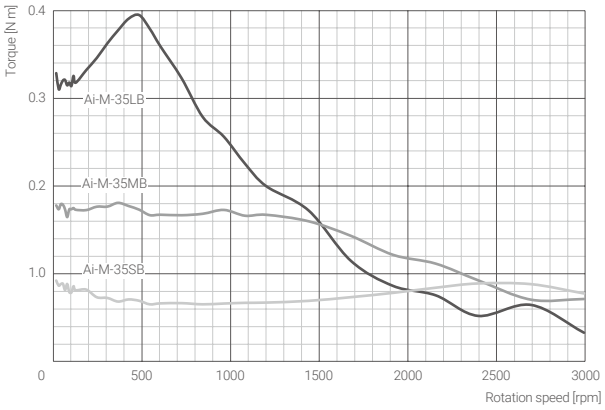
■ □20mm



■ □28mm



■ □35mm



Built-In Gear / Rotary Actuator Type DC Power

2-Phase Closed Loop Stepper Motors

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

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

Ai	-	M	-	❶	M	A	-	❷	❸

❶ Frame size
Number: Frame size (unit: mm)

❷ Motor type
G: Built-in gear type
R: Built-in rotary actuator type

❸ Reduction ratio
5: 1:5
7.2: 1:7.2
10: 1:10

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.

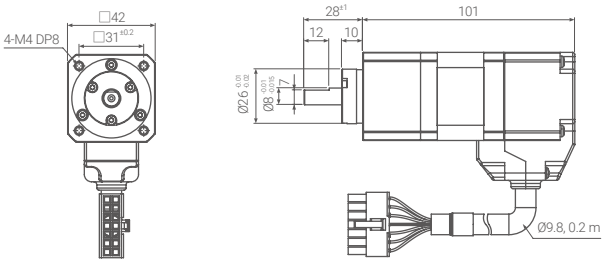
01) Amount of radial shaft displacement when applying radial load (25 N) to the end of the motor shaft
02) Amount of axial shaft displacement when applying axial load (50 N) to the motor shaft

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

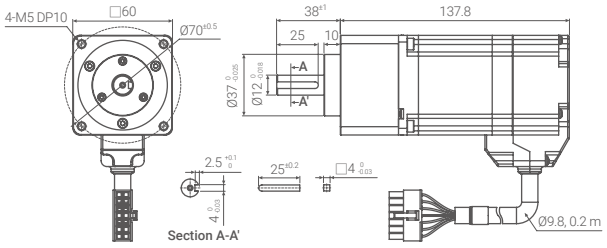
Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

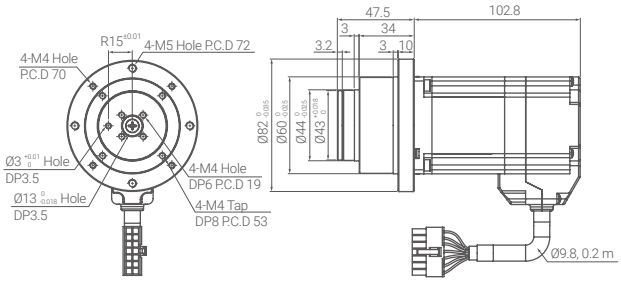
■ Ai-M-42MA-G□



■ Ai-M-60MA-G□

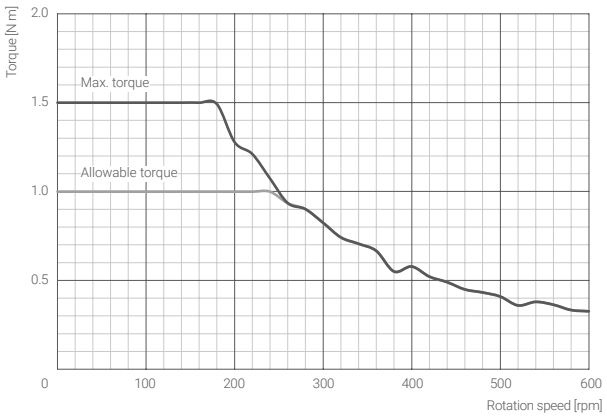


■ Ai-M-60MA-R□

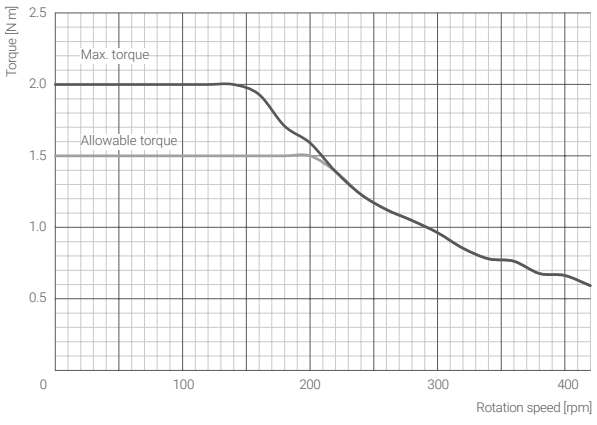


Motor Characteristics

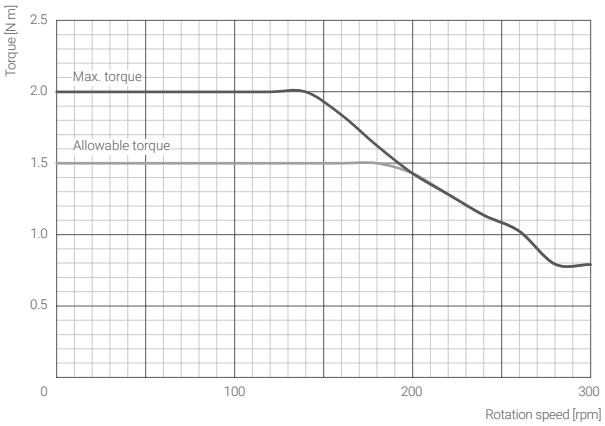
■ Ai-M-42MA-G5



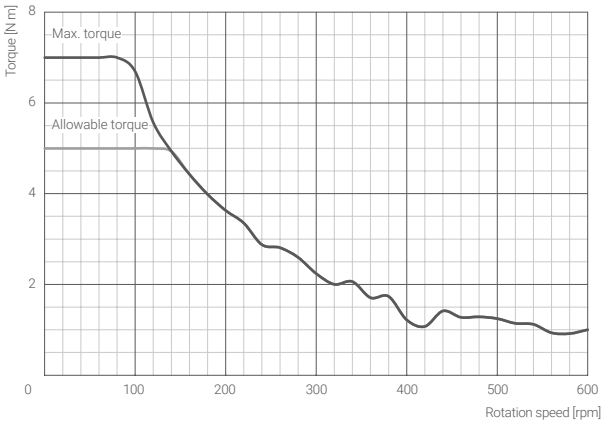
■ Ai-M-42MA-G7.2



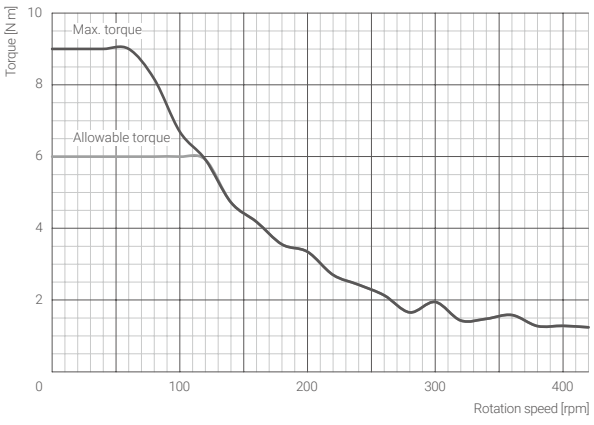
■ Ai-M-42MA-G10



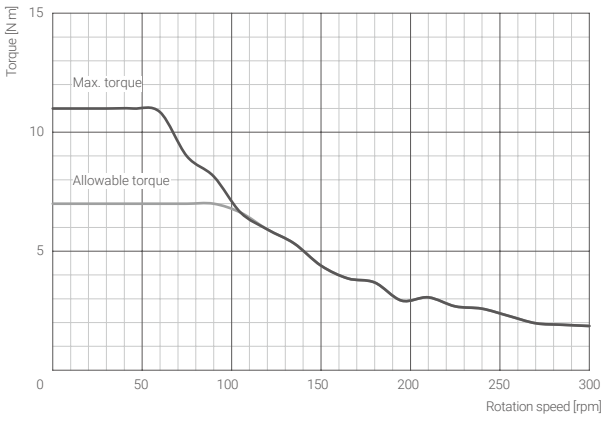
■ Ai-60MA-□5



■ Ai-60MA-□7.2



■ Ai-60MA-□10



Standard Type / Built-In Brake Type AC Power 2-Phase Closed Loop Stepper Motors

AiA-M Series

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

AiA	-	M	-	❶	❷	A	-	❸

❶ Frame size
Number: Frame size (unit: mm)

❷ Axial length
M: Medium
L: Long

❸ Motor type
No mark: Standard type
B: Built-in brake type

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	1,100×10^{-7} kg · m^2	1,800×10^{-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 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: 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.

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

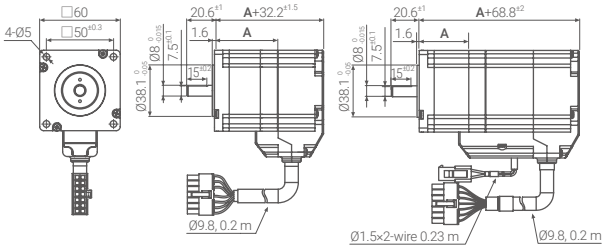
Built-in brake type frame size	□ 60 mm	□ 86 mm
Rated excitation voltage	24 VDC⎓ ±10%	
Rated excitation current	0.275 A	0.479 A
Static friction torque	0.75 N m	2.6 N m
Rotation part inertia moment	1.9×10^{-6} kg · m^2	12×10^{-6} kg · m^2
Insulation class	B type (130°C)	
B type brake	Brake is released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

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

■ □60mm

Standard type

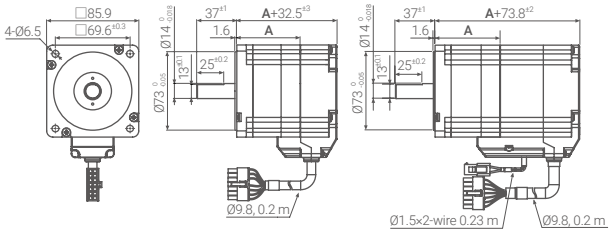


Built-in brake type

Axial length	M	L
A	49	70

■ □86mm

Standard type

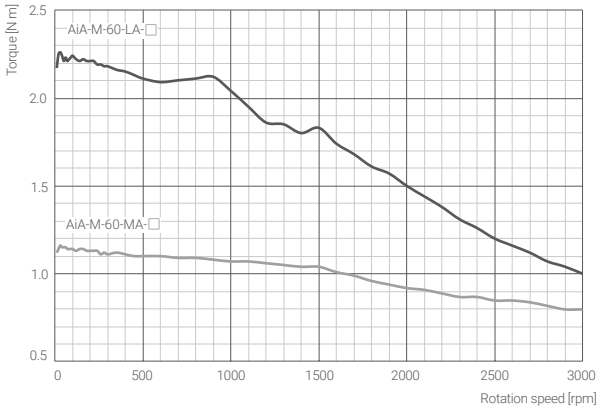


Built-in brake type

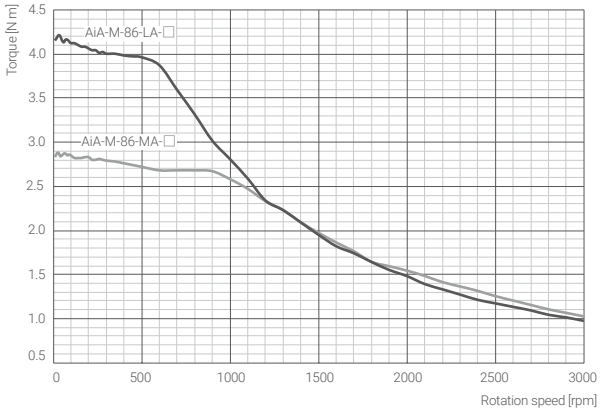
Axial length	M	L
A	61	75

Motor Characteristics

■ □60mm



■ □86mm



Built-In Gear / Rotary Actuator Type AC Power

2-Phase Closed Loop Stepper Motors

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

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

AiA	-	M	-	❶	L	A	-	❷	❸

❶ Frame size
Number: Frame size (unit: mm)

❷ Motor type
G: Built-in gear type
R: Built-in rotary actuator type

❸ Reduction ratio
5: 1:5
7.2: 1:7.2
10: 1:10

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 $\frac{\text{Built-in gear type}}{\text{Built-in rotary actuator type}}$

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)	≈ 3.70 kg (≈ 3.95 kg)		

Motor phase	2-phase
Run method	Bipolar
Insulation class	B type (130℃)
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℃, storage: -20 to 70℃ (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.

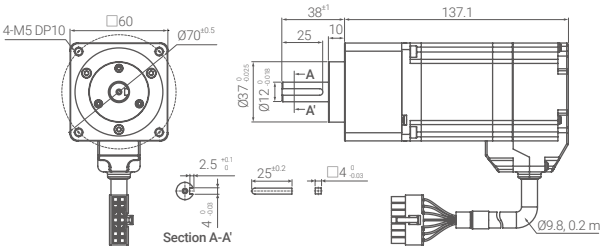
01) Amount of radial shaft displacement when applying radial load (25 N) to the end of the motor shaft
02) Amount of axial shaft displacement when applying axial load (50 N) to the motor shaft

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

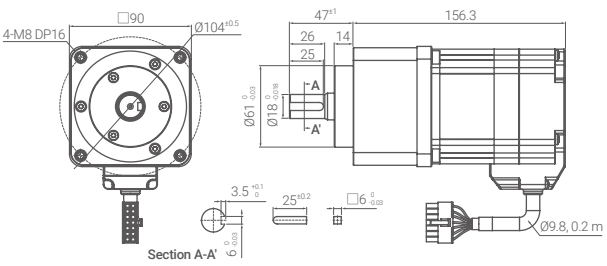
Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

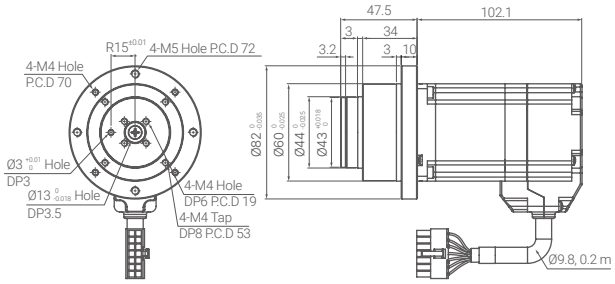
■ **AiA-M-60LA-G□**



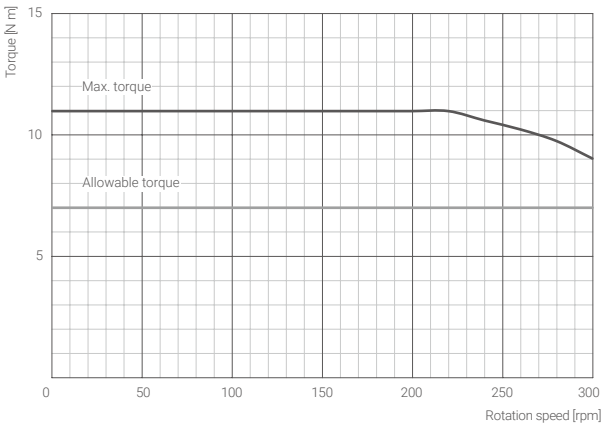
■ AiA-M-86LA-G□



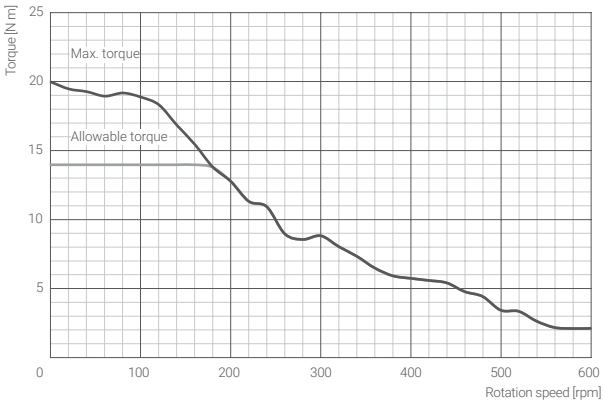
■ AiA-M-60LA-R□



■ AiA-M-60LA-□10

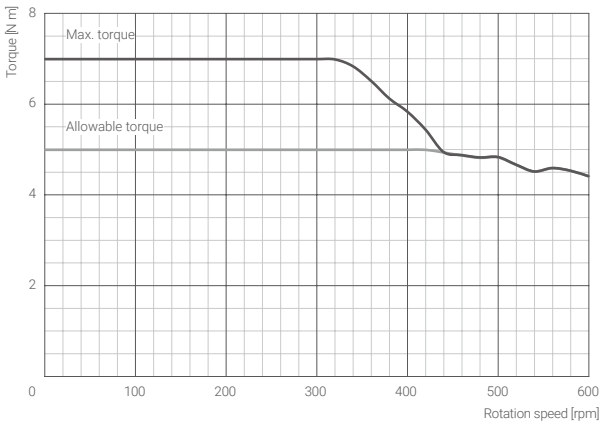


■ AiA-86LA-G5

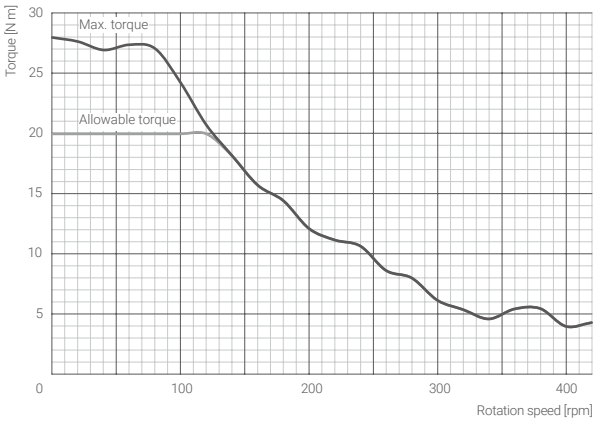


Motor Characteristics

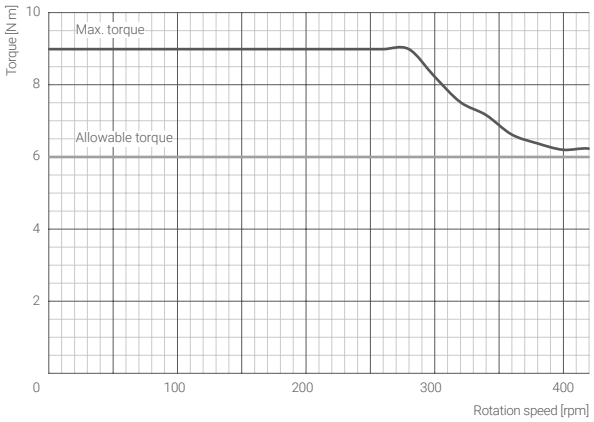
■ AiA-M-60LA-□5



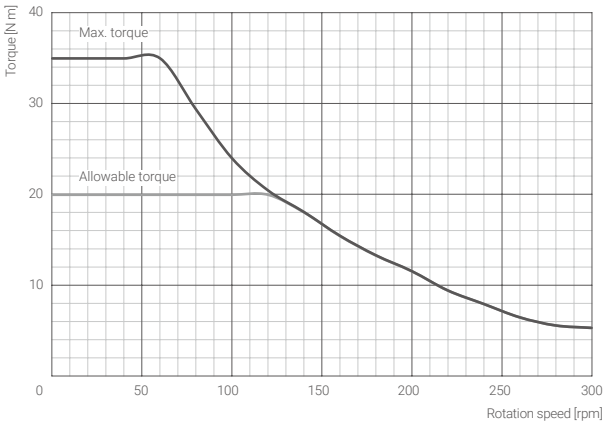
■ AiA-86LA-G7.2



■ AiA-M-60LA-□7.2



■ AiA-86LA-G10



Stepper Motors & Drivers

Stepper motors are very important power tools to drive automation and robotics.
Stepper motors are ideal for small automation as a position control device since the stop position per step is mechanically determined. To drive stepper motors, users need motor drivers for controlling the phase current suitable for the rotation step. Motor drivers control the phase current of the stepper motor to control the position and speed.
Autonics offers a wide range of motion control solutions including various types of stepper motors and motor drivers.

5-Phase Stepper Motors & Drivers

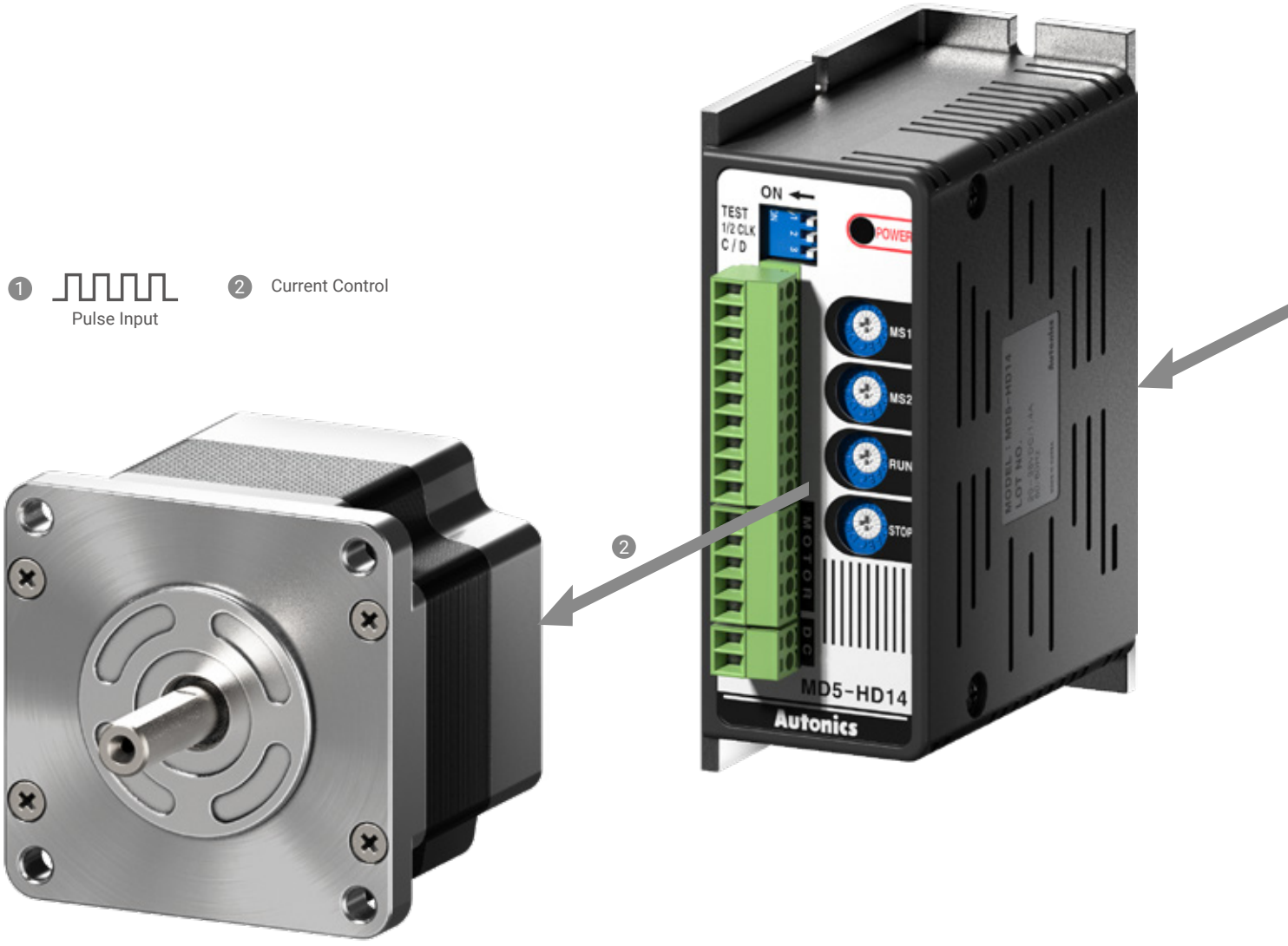
- **5-Phase Stepper Motors** | AK / AHK / AK-G / AK-R Series
- **5-Phase Stepper Drivers** | MD5 Series


ON
TEST
1/2 CLK
POWER
MS1
MS2
RUN
STOP
MOTOR
DC
MD5-HD14
Autonics
MODEL : MD5-HD14
LOT NO.
Autonics

Autonics
Stepper Motors & Drivers

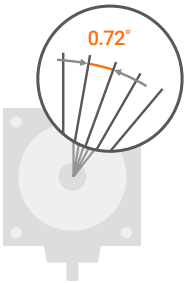
1. Available Open Loop Control with Digital Signals

With PLC, open loop control is available with pulse input (digital) and separate position detection devices are not required. In addition, gain tunning is not required and circuit configuration is simple.



2. Simple and Accurate Control

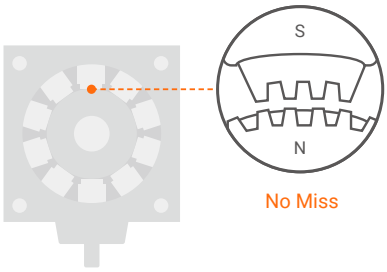
Stepper motors can rotate at a certain angle per step and stop with high accuracy. 5-Phase Stepper motors optimized by pulse input signal are available to control the rotation angle and speed easily.



5-Phase Stepper Motors

3. High Accuracy Position Control

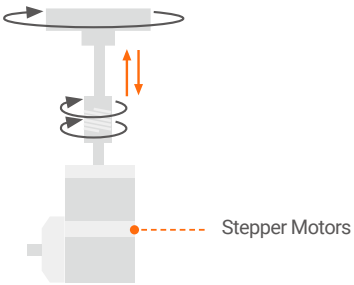
Since 5-Phase stepper motors have a rotation angle of 0.72° (Full step) per step and have no accumulation of stopping errors, repeatability is accurate.

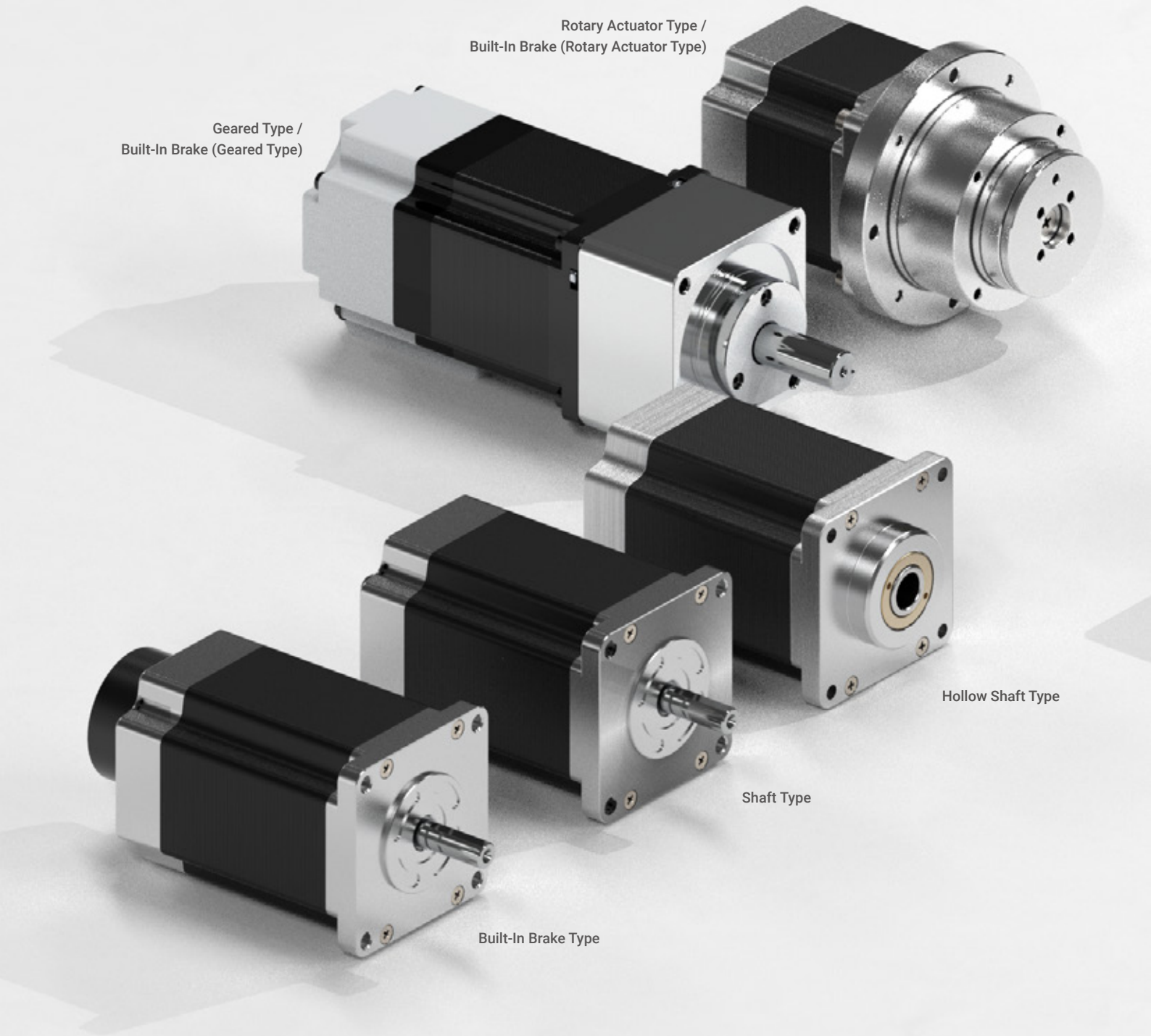


No Miss

4. High Response and Self-Holding

Since the stepper motors rotate synchronously with the input pulse, response in starting, stopping, and reversing is high. In addition, stepper motors have a high holding torque which makes them hold a stop position without mechanical break or control signal.





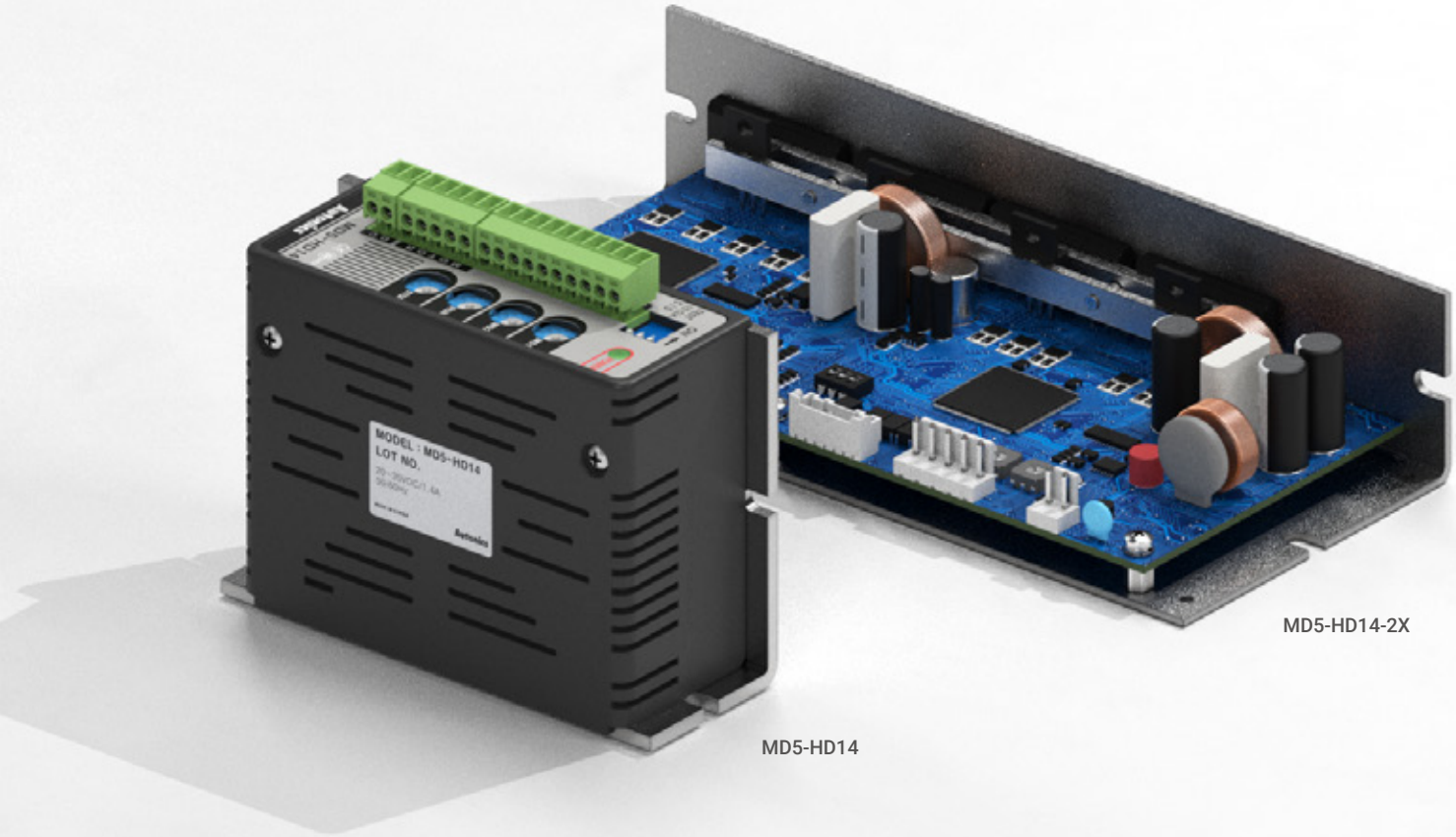
5. Various Lineup

5-1. 5-Phase Motor Lineup

5-phase stepper motors rotate by 0.72˚ per pulse. When using micro step drivers, more precise control is available with rotating 0.00288˚ per pulse.

5-2. Various Motor Frame Sizes and Types

Various motor frame sizes (24 / 42 / 56 / 60 / 85 mm) are provided. Users can apply various motor types (standard type, built-in brake type, hollow shaft type, geared type, built-in rotary actuator, etc.) in different environments.
* Motor frame sizes may vary by type.



MD5-HD14-2X

MD5-HD14

5-3. Various Stepper Drivers Lineup

Various lineup of drivers (micro step type and intelligent type) is provided. Users can customize with flexibility.

Standard / Built-In Brake Type
5-Phase Stepper Motors

AK Series

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

A	❶	K	-	❷	5	❸	❹	❺	-	❻	❼

❶ Max. stop torque
Number: Max. Stop Torque
(unit: kgf cm)

❷ Rated current
S: 0.75 A / Phase
M: 1.4 A / Phase
G: 2.8 A / Phase

❸ Frame size
2: □ 24 mm
4: □ 42 mm
6: □ 60 mm
9: □ 85 mm

❹ Axial length
Number: Refer to 'Dimensions'

❺ Shaft type
No mark: Single shaft
W: Dual shaft

❻ Wiring method
No mark: Pentagon
S: Standard (option)

❼ Motor type
No mark: Standard type
B: Built-in brake type

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 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.

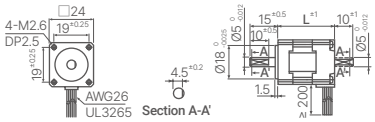
01) In case of rated current: 0.75 A / Phase, Between motor coil and case: 500 VAC~ 50 / 60 Hz for 1 minute
02) Amount of radial shaft displacement when applying radial load (5 N) to the end of the shaft.
03) Amount of axial shaft displacement when applying axial load (10 N) to the shaft.

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

Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.
- The dotted lines are included in dual shaft type.

■ □24mm

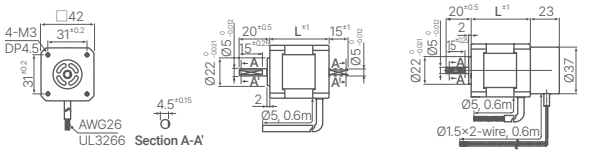


Axial length	3	5
L	30.5	46.5

■ □42mm

Standard type

Built-in brake type

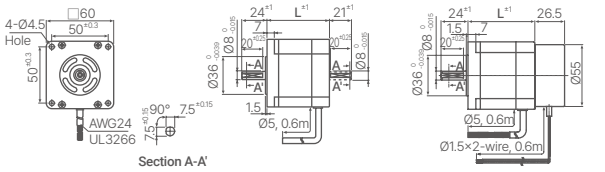


Axial length	3	4	5
L	33	39	47

■ □60mm

Standard type

Built-in brake type

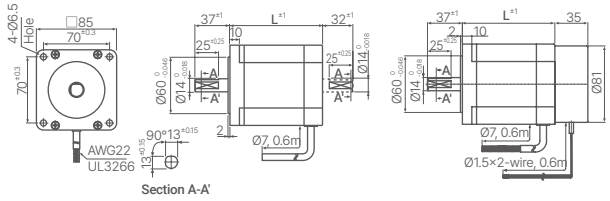


Axial length	4	6	7
L	48.5	59.5	89

■ □85mm

Standard type

Built-in brake type

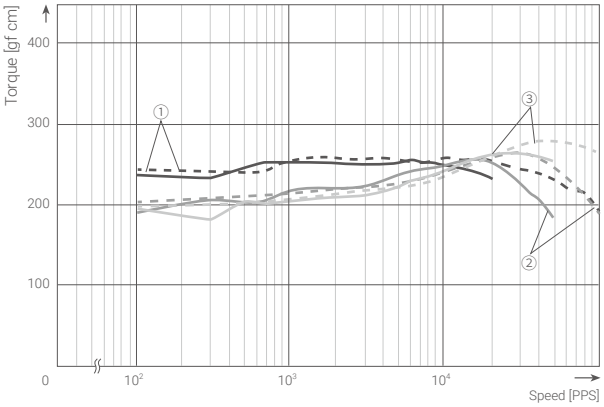


Axial length	6	9	13
L	68	98	128

Motor Characteristics

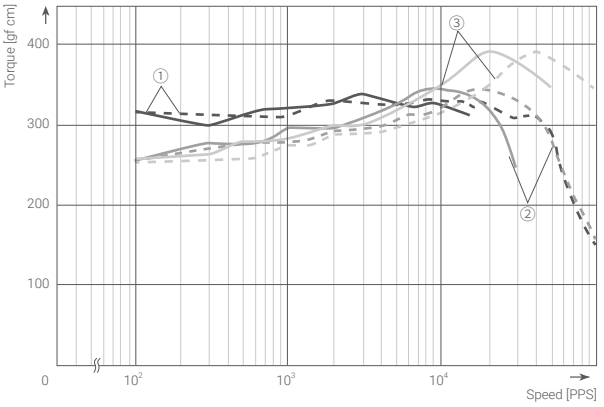
—— Full Step - - - - - Half Step

■ 02K-S523



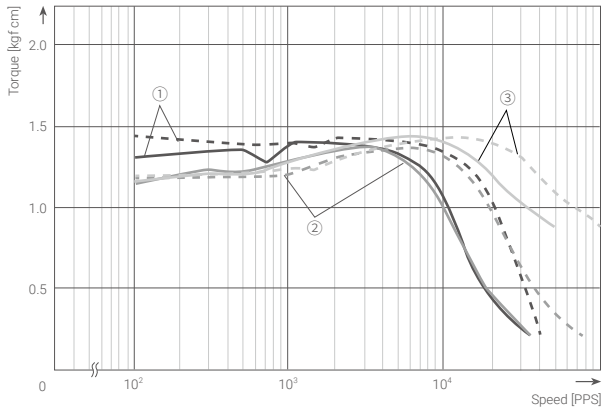
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	0.75 A / Phase	3.6 / 7.1 kpps
②	MD5-HD14	24 VDC	0.75 A / Phase	3.7 / 7.2 kpps
③	MD5-HF14	220 VAC	0.75 A / Phase	3.8 / 7.5 kpps

■ 04K-S525



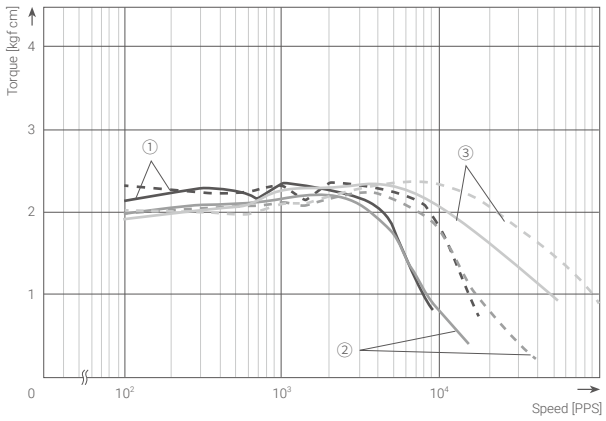
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	0.75 A / Phase	3.1 / 6.1 kpps
②	MD5-HD14	24 VDC	0.75 A / Phase	3.2 / 6.3 kpps
③	MD5-HF14	220 VAC	0.75 A / Phase	3.3 / 6.5 kpps

A1K-S543



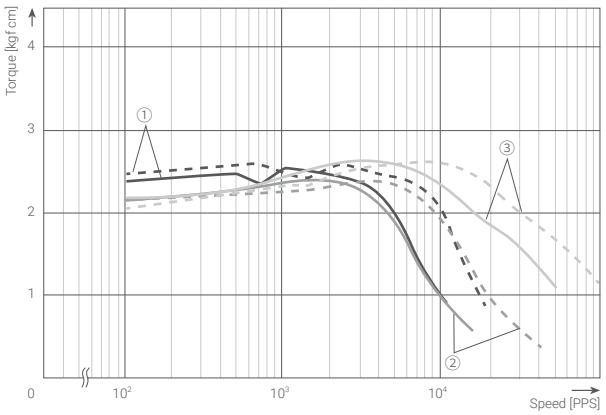
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	0.75 A / Phase	3.3 / 6.6 kpps
②	MD5-HD14	24 VDC	0.75 A / Phase	3.4 / 6.7 kpps
③	MD5-HF14	220 VAC	0.75 A / Phase	3.5 / 6.8 kpps

A2K-□544



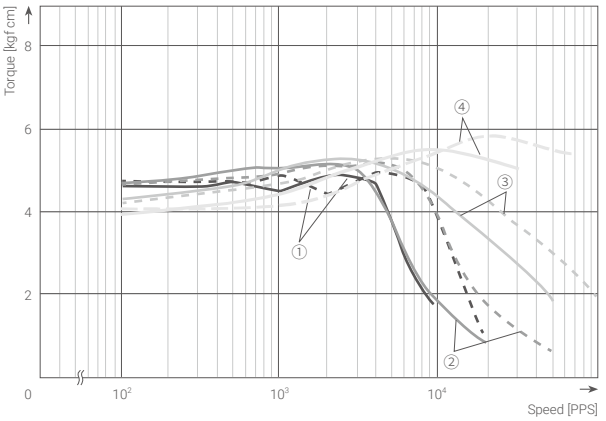
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	0.75 A / Phase	3.2 / 6.3 kpps
②	MD5-HD14	24 VDC	0.75 A / Phase	3.3 / 6.5 kpps
③	MD5-HF14	220 VAC	0.75 A / Phase	3.4 / 6.7 kpps

A3K-S545



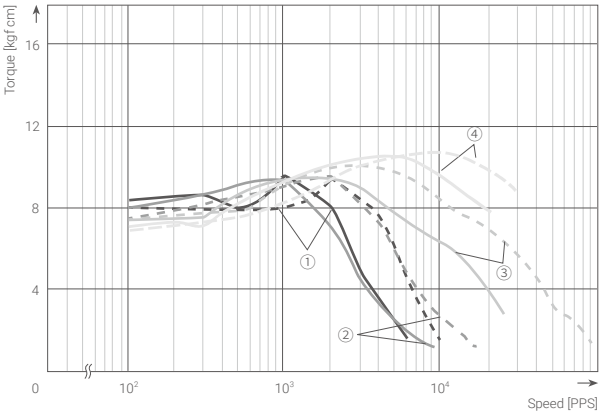
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	0.75 A / Phase	3.0 / 5.9 kpps
②	MD5-HD14	24 VDC	0.75 A / Phase	3.1 / 6.1 kpps
③	MD5-HF14	220 VAC	0.75 A / Phase	3.2 / 6.4 kpps

A4K-□564



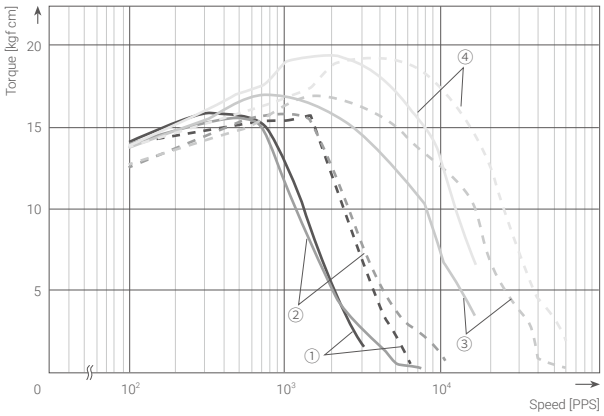
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	2.7 / 5.3 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	2.7 / 5.8 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	3.7 / 7.2 kpps
④	MD5-HF28	220 VAC	2.8 A / Phase	3.4 / 6.8 kpps

A8K-□566



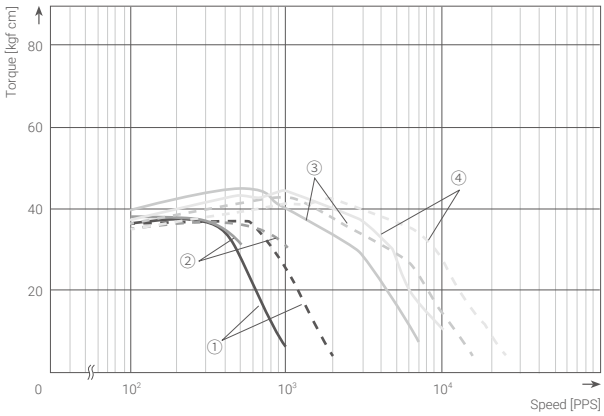
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	2.1 / 4.1 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	2.1 / 4.2 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	3.2 / 6.3 kpps
④	MD5-HF28	220 VAC	2.8 A / Phase	3.3 / 6.6 kpps

■ A16K-□569



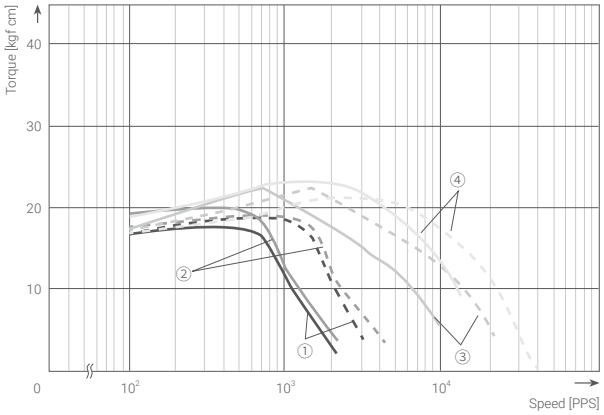
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	1.8 / 3.5 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	1.9 / 3.5 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	2.6 / 5.2 kpps
④	MD5-HF28	220 VAC	2.8 A / Phase	3.4 / 6.8 kpps

■ A41K-□599



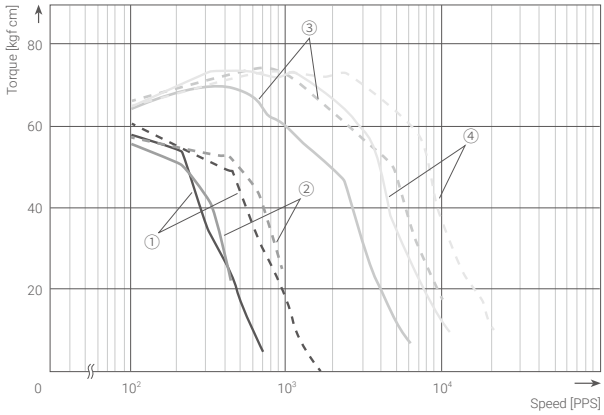
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	1.4 / 2.7 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	1.5 / 2.9 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	1.8 / 3.6 kpps
④	MD5-HF28	220 VAC	2.8 A / Phase	2.1 / 4.3 kpps

■ A21K-□596



Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	1.5 / 2.9 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	1.6 / 3.1 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	2.2 / 4.4 kpps
④	MD5-HF28	220 VAC	2.8 A / Phase	2.3 / 4.6 kpps

■ A63K-□5913



Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	1.0 / 2.1 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	1.1 / 2.2 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	1.8 / 3.6 kpps
④	MD5-HF28	220 VAC	2.8 A / Phase	1.9 / 3.8 kpps

Hollow Shaft Type

5-Phase Stepper Motors

AHK Series

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

A	H	❶	K	-	❷	5	❸	❹	❺	-	❻

❶ Max. stop torque
Number: Max. stop torque (unit: kgf cm)

❷ Rated current
S: 0.75 A / Phase
M: 1.4 A / Phase
G: 2.8 A / Phase

❸ Frame size
4: □ 42 mm
6: □ 60 mm
9: □ 85 mm

❹ Axial length
Number: Refer to 'Dimensions

❺ Shaft type
No mark: single shaft
W: dual shaft

❻ Wiring method
No mark: Pentagon
S: Standard (option)

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	1,400×10^{-7} kg · m^2	2,700×10^{-7} kg · m^2	4,000×10^{-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)

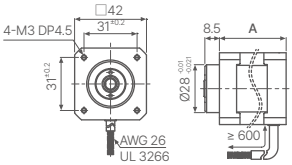
Motor phase	5-phase
Insulation class	B type (130°C)
Insulation resistance	Between motor coil and case: ≥ 100 MΩ (500 VDC⎓ megger)
Dielectric strength 01)	Between motor coil and case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Temperature rise	≤ 80°C (5-phase excitation for rated current, while stop)
Ambient 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

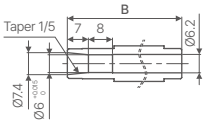
Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.
- The external shaft must be processed as shown below.
- The corresponding motor follows direct connection instead of using coupling.
- Depending on shaft processing, hollow shaft can be used both single and dual. Gray line in shaft process is only available in dual shaft type.

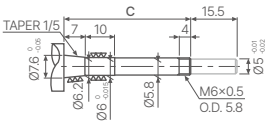
■ □42mm



Hole dimensions

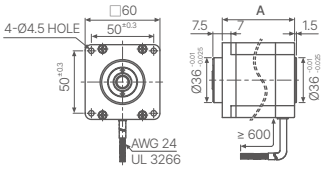


Shaft process

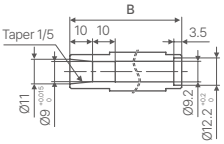


Axial length	3	4	5
A	33	39	47
B	38	44	52
C	42.5	48.5	56.5

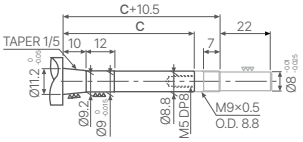
■ □60mm



Hole dimensions

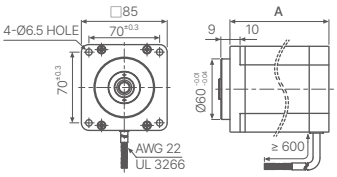


Shaft process

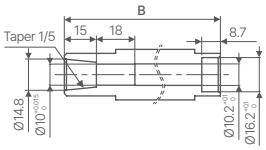


Axial length	4	6	9
A	48.5	59.5	89
B	49.3	60.3	89.8
C	46	57	86.5

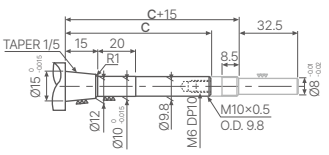
■ □85mm



Hole dimensions



Shaft process

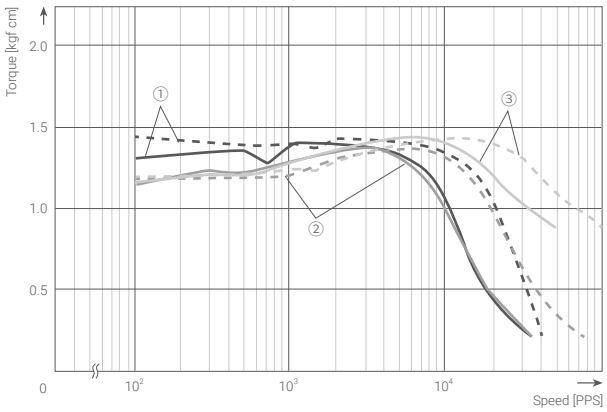


Axial length	6	9	13
A	68	98	128
B	73	102.5	133
C	64.5	94	124.5

Motor Characteristics

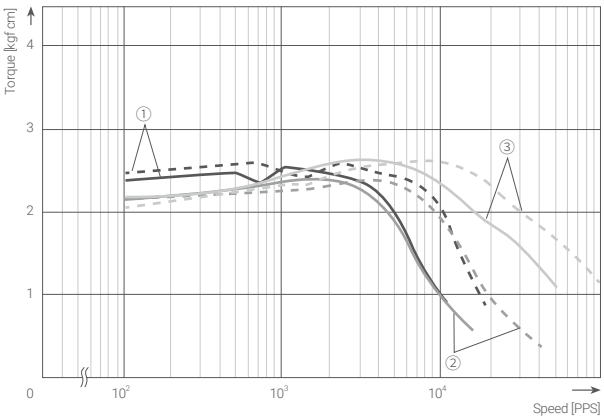
—— Full Step - - - - - Half Step

■ AH1K-S543-□



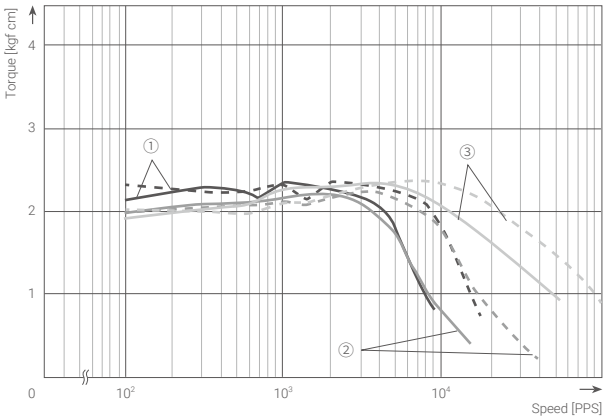
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	0.75 A / Phase	3.3 / 6.6 kpps
②	MD5-HD14	24 VDC	0.75 A / Phase	3.4 / 6.7 kpps
③	MD5-HF14	220 VAC	0.75 A / Phase	3.5 / 6.8 kpps

■ AH3K-S545



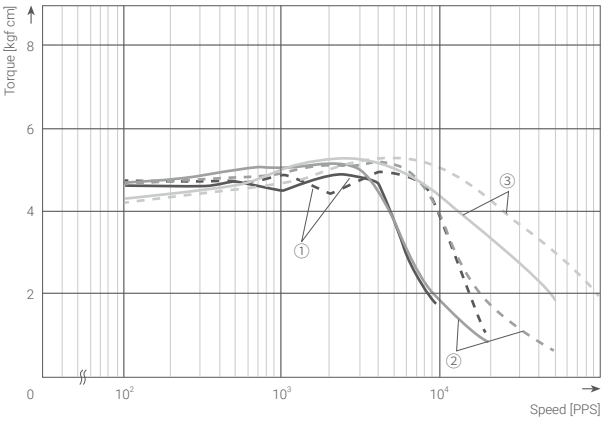
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	0.75 A / Phase	3.0 / 5.9 kpps
②	MD5-HD14	24 VDC	0.75 A / Phase	3.1 / 6.1 kpps
③	MD5-HF14	220 VAC	0.75 A / Phase	3.2 / 6.4 kpps

■ AH2K-□544



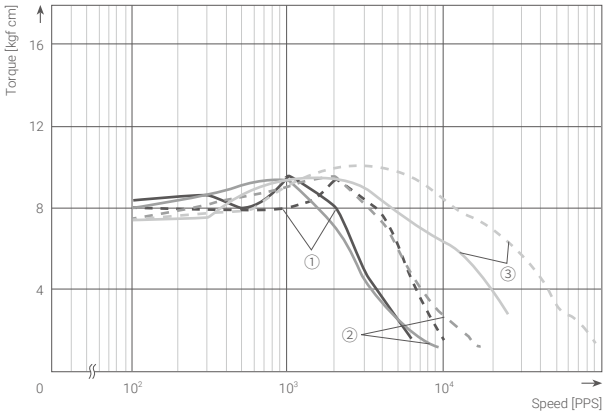
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	0.75 A / Phase	3.2 / 6.3 kpps
②	MD5-HD14	24 VDC	0.75 A / Phase	3.3 / 6.5 kpps
③	MD5-HF14	220 VAC	0.75 A / Phase	3.4 / 6.7 kpps

■ AH4K-□564



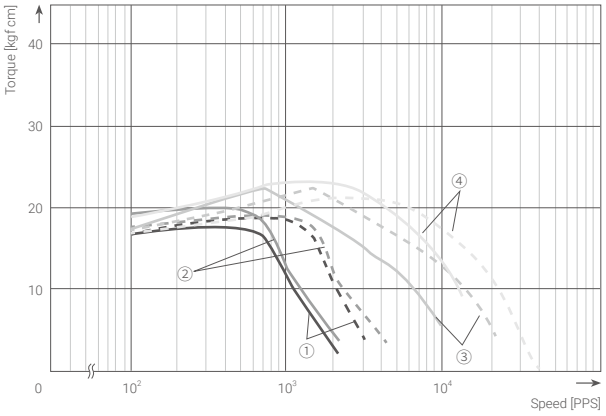
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	2.7 / 5.3 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	2.7 / 5.8 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	3.7 / 7.2 kpps

■ AH8K-□566



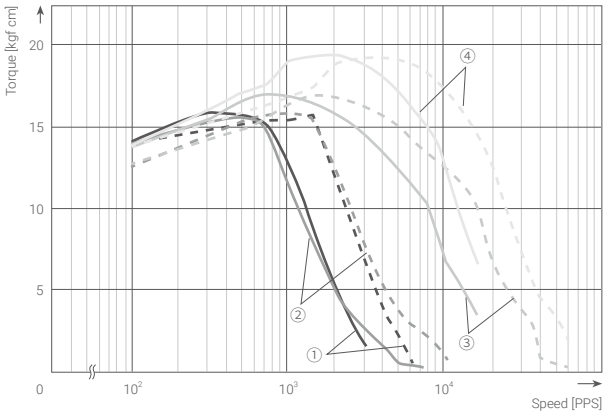
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	2.1 / 4.1 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	2.1 / 4.2 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	3.2 / 6.3 kpps

■ AH21K-□596



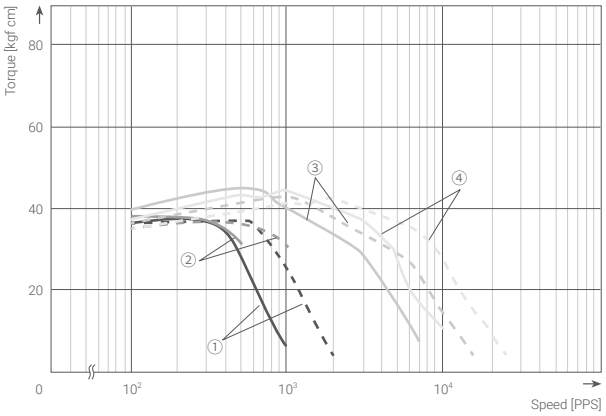
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	1.5 / 2.9 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	1.6 / 3.1 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	2.2 / 4.4 kpps
④	MD5-HF28	220 VAC	2.8 A / Phase	2.3 / 4.6 kpps

■ AH16K-□569



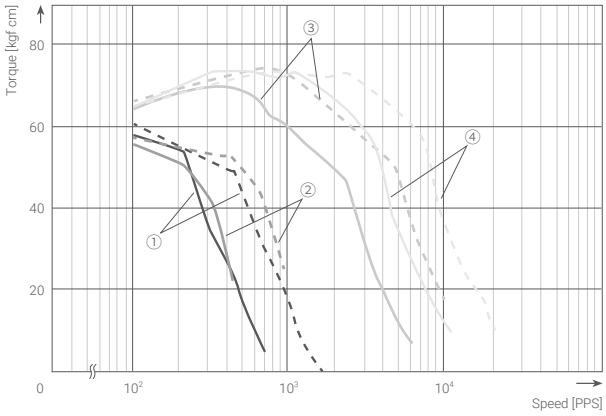
Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	1.8 / 3.5 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	1.9 / 3.5 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	2.6 / 5.2 kpps
④	MD5-HF28	220 VAC	2.8 A / Phase	3.4 / 6.8 kpps

■ AH41K-□599



Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	1.4 / 2.7 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	1.5 / 2.9 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	1.8 / 3.6 kpps
④	MD5-HF28	220 VAC	2.8 A / Phase	2.1 / 4.3 kpps

■ AH63K-□5913



Index	Driver	Power supply	Setting current	Max. self-starting frequency (Full Step / Half Step)
①	MD5-ND14	24 VDC	1.4 A / Phase	1.0 / 2.1 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	1.1 / 2.2 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	1.8 / 3.6 kpps
④	MD5-HF28	220 VAC	2.8 A / Phase	1.9 / 3.8 kpps

Built-In Gear / Rotary Actuator Type

5-Phase Stepper Motors

AK-G / AK-R Series

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

A	❶	K	-	❷	5	❸	❹	❺	-	❻	❼

❶ Max. Allowable torque
Number: Max. allowable torque
(unit: kgf cm)

❷ Rated current
S: 0.75 A / Phase
M: 1.4 A / Phase
G: 2.8 A / Phase

❸ Frame size
4: □ 42 mm
6: □ 60 mm
9: □ 85 mm

❹ Axial length
Number: Refer to 'Dimensions'

❺ Shaft type
No mark: Single shaft
W: Dual shaft

❻ Motor type
G: Built-in gear type
GB: Built-in gear + brake type
R: Built-in rotary actuator type
RB: Built-in rotary actuator + brake type

❼ Reduction ratio
5: 1:5
7.2: 1:7.2
10: 1:10

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 ~ 360 rpm	0 ~ 250 rpm	0 ~ 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 ~ 360 rpm	0 ~ 250 rpm	0 ~ 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]	2,700×10^{-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 ~ 360 rpm	0 ~ 250 rpm	0 ~ 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 $\frac{\text{Standard type}}{\text{Built-in brake type}}$

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.

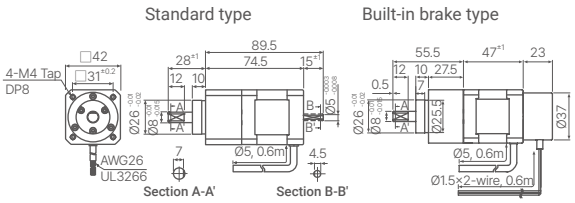
01) In case of rated current: 0.75 A/Phase, Between motor coil and case: 500 VAC~ 50/60 Hz for 1 minute
02) The corresponding value is only available in built-in gear type.
03) The corresponding value is only available in built-in rotary actuator type.
04) Amount of radial shaft displacement when applying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

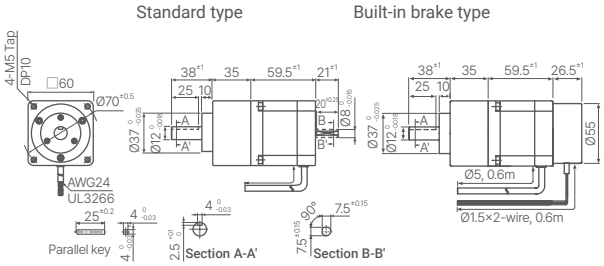
Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.
- The dotted lines are included in dual shaft type.

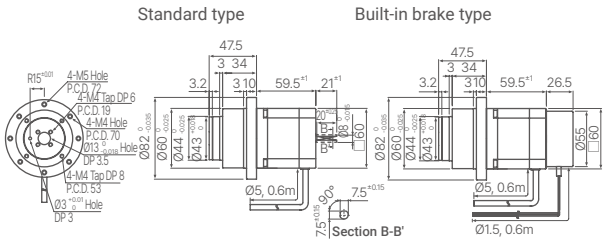
■ ☐ 42 mm Built-in gear type



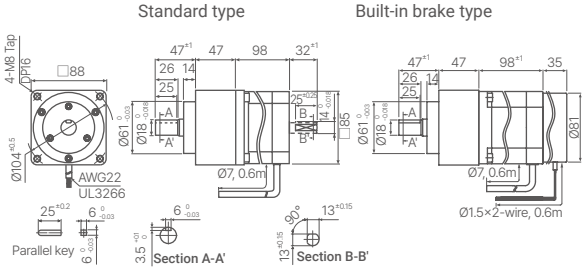
■ ☐ 60 mm Built-in gear type



■ ☐ 60 mm Built-in rotary actuator type

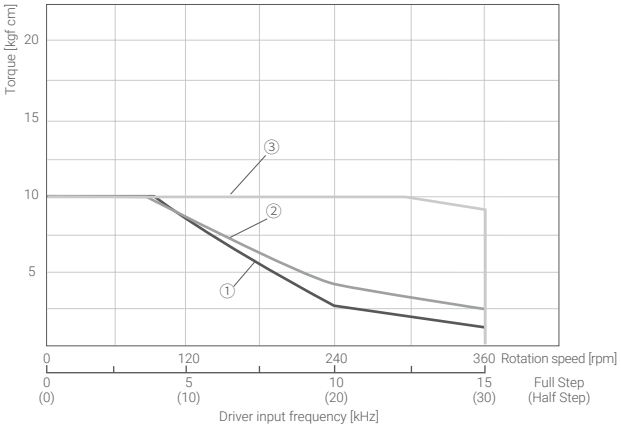


■ ☐ 85 mm Built-in gear type



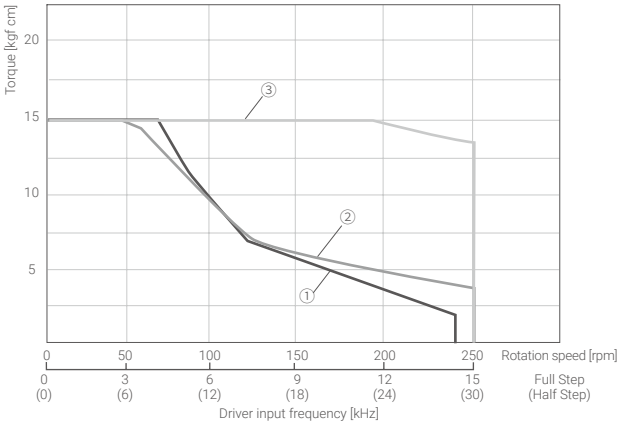
Motor Characteristics

■ A10K-S545(W)-G5



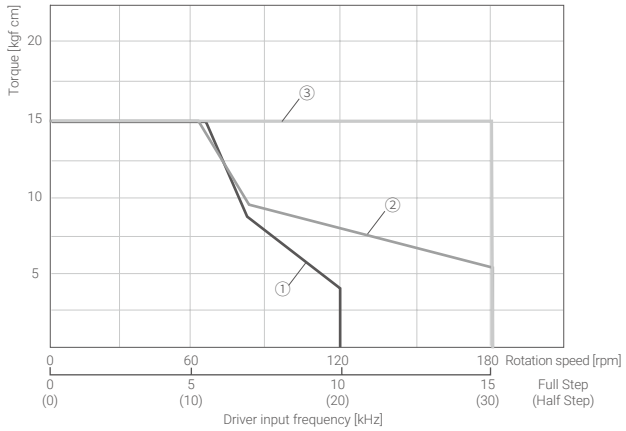
Index	Driver	Power supply	Setting current	Max. self-starting frequency
①	MD5-ND14	24 VDC	1.4 A / Phase	3.1 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	3.2 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	3.2 kpps

■ A15K-S545(W)-G7.2



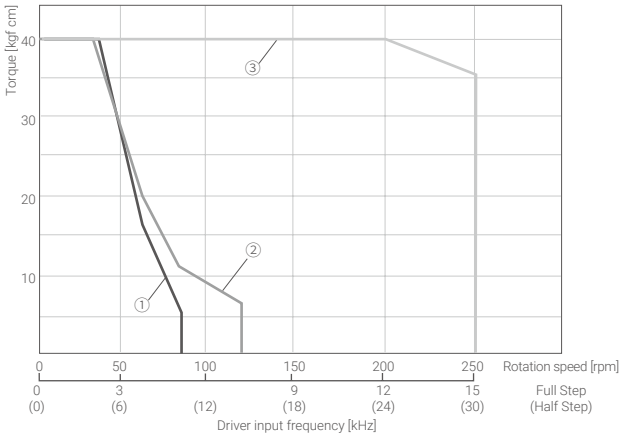
Index	Driver	Power supply	Setting current	Max. self-starting frequency
①	MD5-ND14	24 VDC	1.4 A / Phase	3.2 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	3.3 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	3.4 kpps

■ A15K-S545(W)-G10



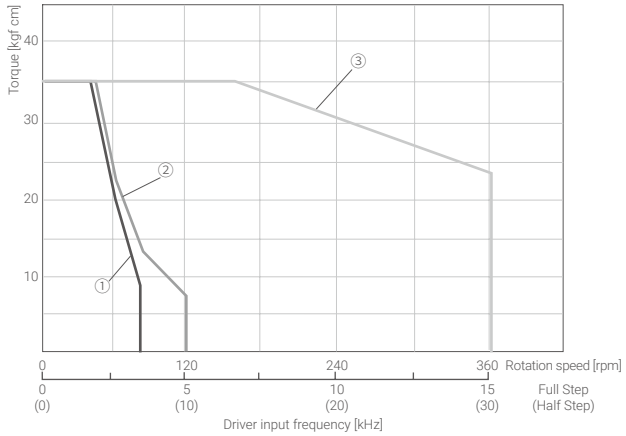
Index	Driver	Power supply	Setting current	Max. self-starting frequency
①	MD5-ND14	24 VDC	1.4 A / Phase	3.3 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	3.3 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	3.4 kpps

■ A40K-M566(W)-□7.2



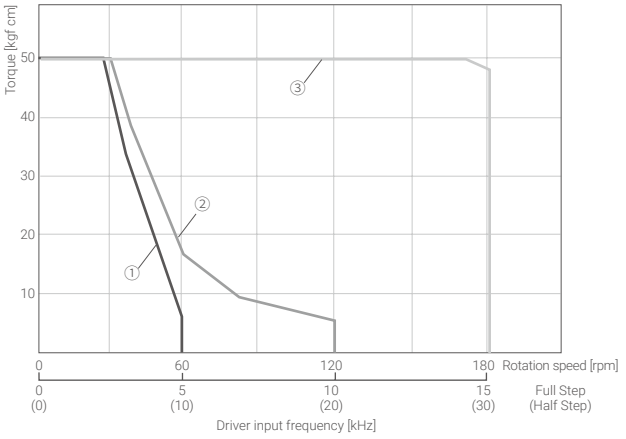
Index	Driver	Power supply	Setting current	Max. self-starting frequency
①	MD5-ND14	24 VDC	1.4 A / Phase	2.2 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	2.3 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	2.6 kpps

■ A35K-M566(W)-□5



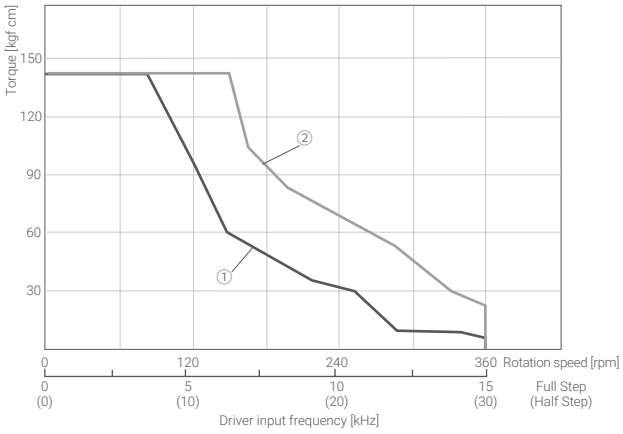
Index	Driver	Power supply	Setting current	Max. self-starting frequency
①	MD5-ND14	24 VDC	1.4 A / Phase	2.3 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	2.3 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	2.6 kpps

■ A50K-M566(W)-□10



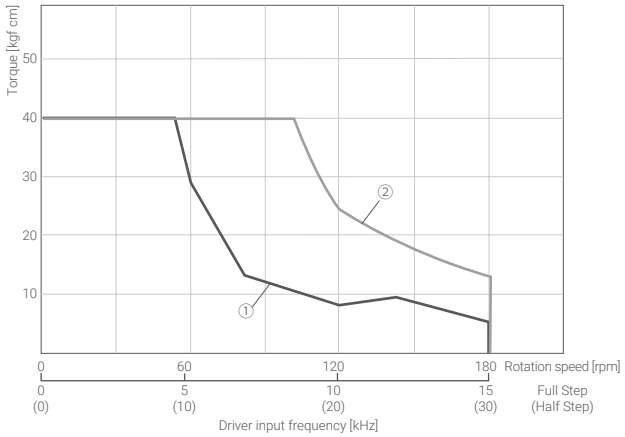
Index	Driver	Power supply	Setting current	Max. self-starting frequency
①	MD5-ND14	24 VDC	1.4 A / Phase	2.3 kpps
②	MD5-HD14	24 VDC	1.4 A / Phase	2.3 kpps
③	MD5-HF14	220 VAC	1.4 A / Phase	2.8 kpps

■ A140K-□599(W)-G5



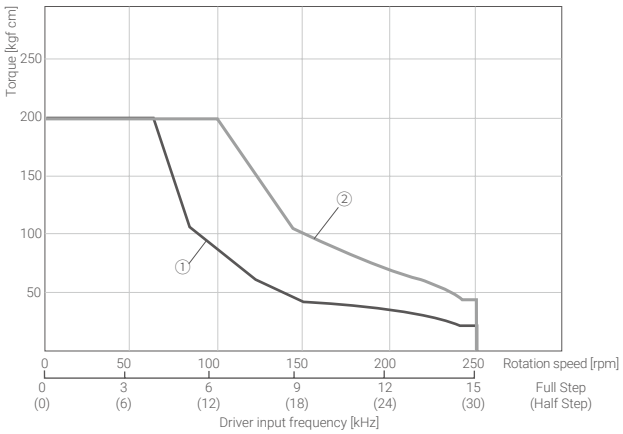
Index	Driver	Power supply	Setting current	Max. self-starting frequency
①	MD5-HF14	220 VAC	1.4 A / Phase	1.8 kpps
②	MD5-HF28	220 VAC	2.8 A / Phase	2.1 kpps

■ A200K-□599(W)-G10



Index	Driver	Power supply	Setting current	Max. self-starting frequency
①	MD5-HF14	220 VAC	1.4 A / Phase	1.9 kpps
②	MD5-HF28	220 VAC	2.8 A / Phase	2.1 kpps

■ A200K-□599(W)-G7.2



Index	Driver	Power supply	Setting current	Max. self-starting frequency
①	MD5-HF14	220 VAC	1.4 A / Phase	1.8 kpps
②	MD5-HF28	220 VAC	2.8 A / Phase	2.1 kpps

Micro Step

5-Phase Stepper Motor Drivers

MD5 Series

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

MD	5	-	❶	❷	❸	-	❹

❶ Step type (resolution)
H: Micro step (250-division)
N: Normal Step

❷ Power supply
D: 20-35VDC
F: 100-220VAC

❸ RUN current
14: 1.4A/Phase
28: 2.8A/Phase

❹ Output
No mark: Zero point excitation output
AO: Alarm output

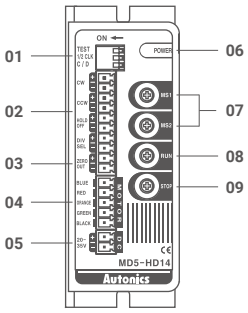
Specifications

Model	MD5-HD14	MD5-HF14	MD5-HF14-AO	MD5-HF28	MD5-ND14
Power supply 01)	24 - 35 VDC⎓ ± 10%	100 - 220 VAC~ 50 / 60 Hz ± 10%			20 - 35 VDC⎓ ± 10%
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)			5 A (based on ambient temp. 25°C, ambient humi. 55%RH)	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current 02)	0.4 - 1.4 A / Phase			1.0 - 2.8 A / Phase	0.5 - 1.5 A / Phase
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)				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, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)				1 division (0.72° / Step), 2 division (0.36° / Step)
Pulse widt	≥ 10 μs (CW / CCW), ≥ 1 ms (HOLD OFF)	≥ 1 μs (CW / CCW), ≥ 1 ms (HOLD OFF)			≥ 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)		7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF)	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF, DIVISION SELECTION, ZERO OUT)	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF)
Max. input pulse freq.	≤ 500 kHz (CW / CCW)				≤ 50 kHz (CW / CCW)
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF, DIVISION SELECTION), 10 Ω (ZERO OUT)				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	± 2000 VDC⎓ square wave noise (pulse width: 1 μs) by the noise simulator			± 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)	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)			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	CE cULus EAC			CE EAC
Unit weight (packaged)	≈ 220 g (≈ 327.5 g)	≈ 690 g (≈ 840 g)	≈ 660 g (≈ 820 g)	≈ 1.2 kg (≈ 1.35 kg)	≈ 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.

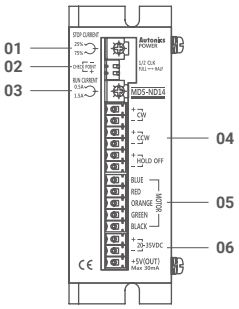
Unit Descriptions

■ MD5-HD14



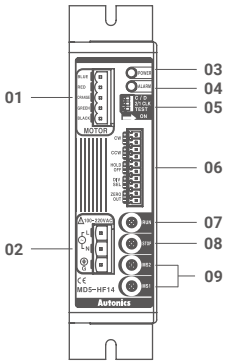
01. Function selection DIP switch
02. Input terminal
03. Zero output terminal
04 .Motor terminal
05. Power terminal
06. Power indicator
07. Resolution setting rotary switch
08. RUN current setting rotary switch
09. Stop Current setting rotary switch

■ MD5-ND14



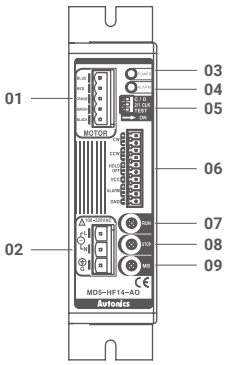
01. Stop current setting rotary switch
02. Function selection DIP switch
03. RUN current setting rotary switch
04. Input terminal
05. Motor terminal
06. Power terminal

■ MD5-HF14



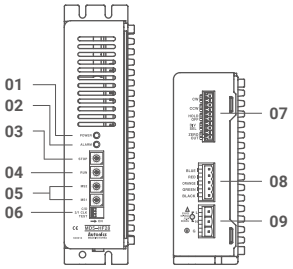
01. Motor terminal
02. Power terminal
03. Power indicator
04. Alarm indicator
05. Function selection DIP switch
06. Input terminal
07. RUN current setting rotary switch
08. Stop current setting rotary switch
09. Resolution setting rotary Switch

■ MD5-HF14-AO



01. Motor terminal
02. Power terminal
03. Power indicator
04. Alarm indicator
05. Function selection DIP switch
06. Input terminal
07. RUN current setting rotary switch
08. Stop current setting rotary switch
09. Resolution setting rotary switch

■ MD5-HF28

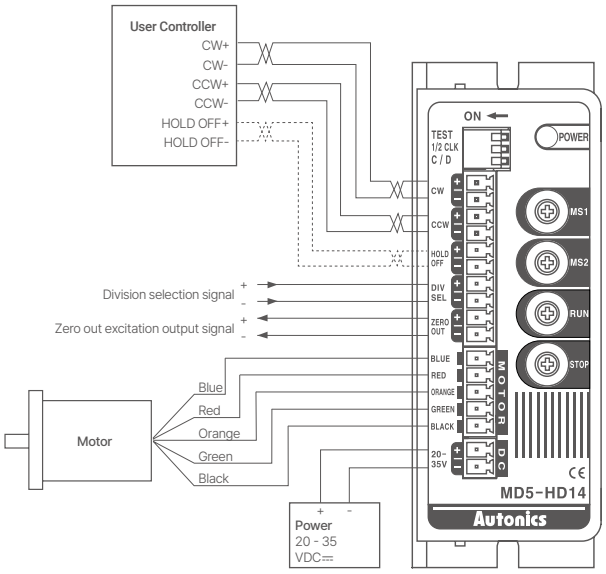


01. Power indicator
02. Alarm indicator
03. Stop current setting rotary switch
04. RUN current setting rotary switch
05. Resolution setting rotary switch
06. Function selection DIP switch
07. Input terminal
08. Motor terminal
09. Power terminal

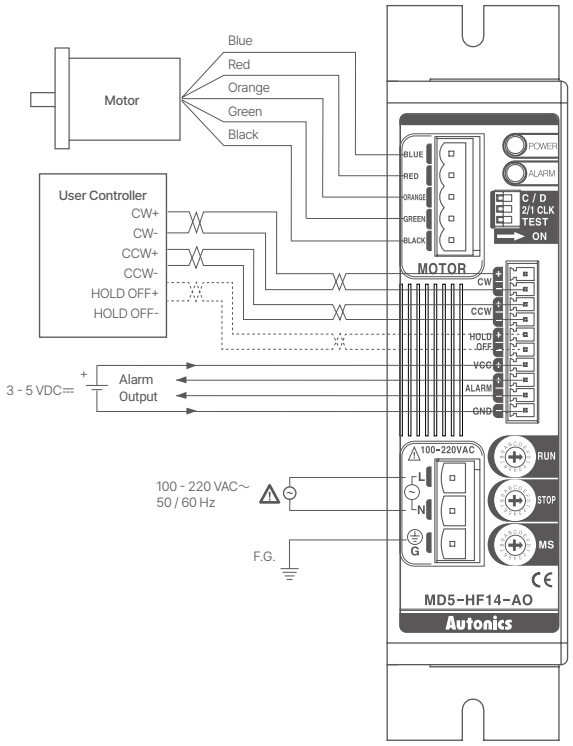
Connections

• In case of standard wiring type, refer to installation method on 5-phase stepper motor.

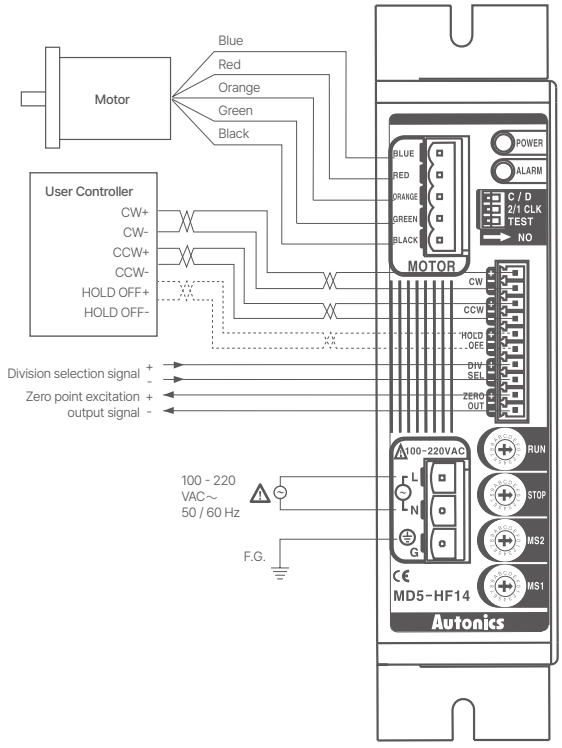
■ MD5-HD14



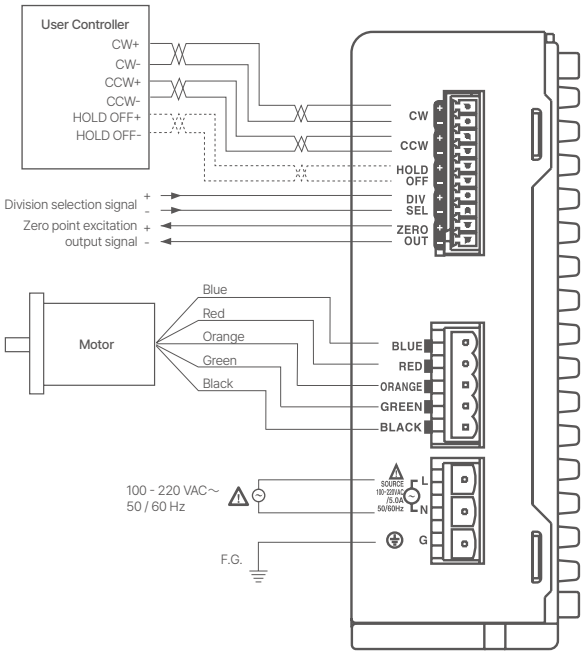
■ MD5-HF14-AO



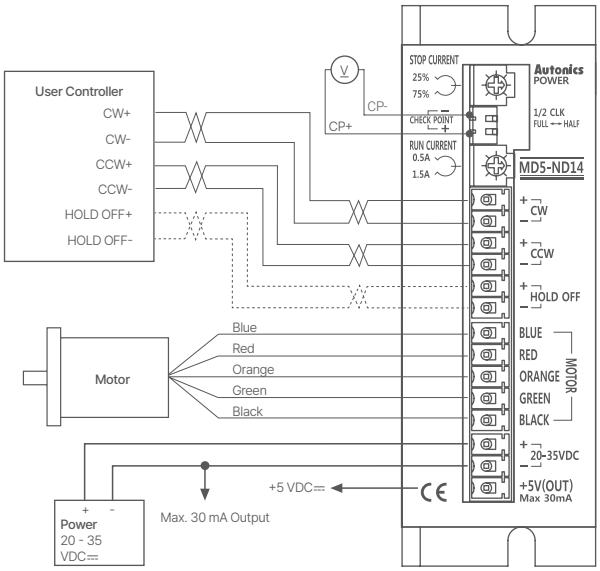
■ MD5-HF14



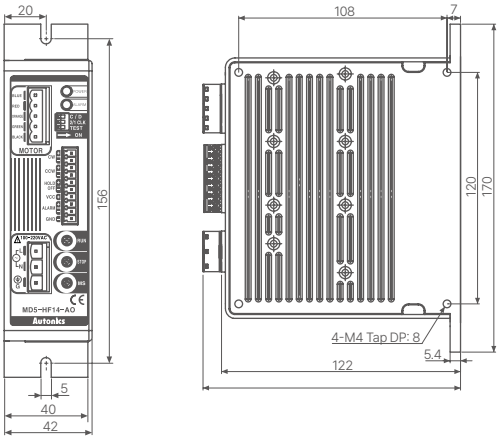
■ MD5-HF28



■ MD5-ND14



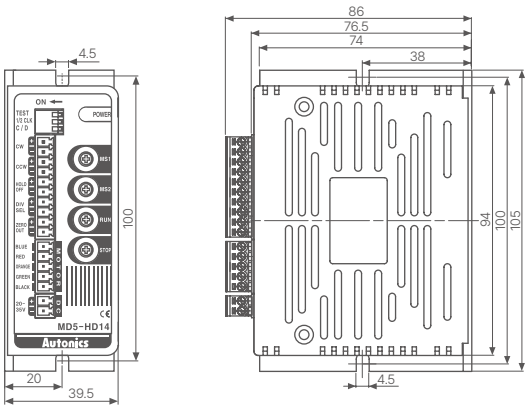
■ MD5-HF14-AO



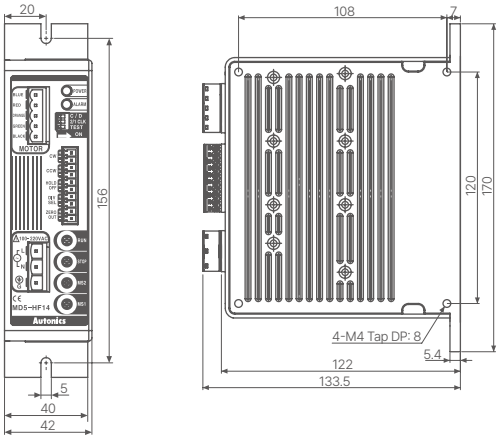
Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

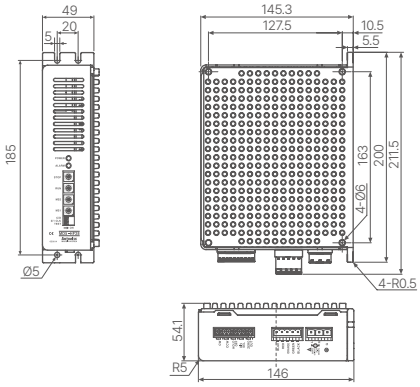
■ MD5-HD14



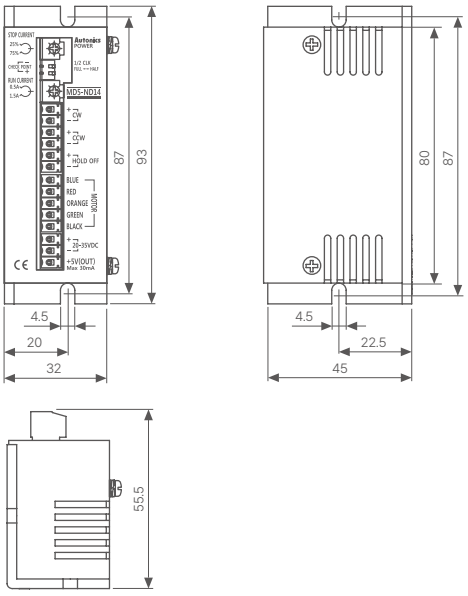
■ MD5-HF14



■ MD5-HF28



■ MD5-ND14



Micro Step

5-Phase Stepper Motor Drivers

MD5 Series

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

MD	5	-	❶	❷	❸	-	❹

❶ Step method (resolution)
H: Micro step (250-division)

❷ Power supply
D: 20-35VDC

❸ RUN current
14: 1.4 A / Phase

❹ Axes
2X: 2-axis
3X: 3-axis

Specifications

Vibration	MD5-HD14-2X	MD5-HD14-3X
(malfunction)	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 04))	
Max. input pulse freq.	≤ 500 kHz (CW / CCW)	
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF), 10 Ω (ZERO OUT 04))	
Insulation resistance	Between all terminal and case: ≥ 100 MΩ (500 VDC⎓ megger)	

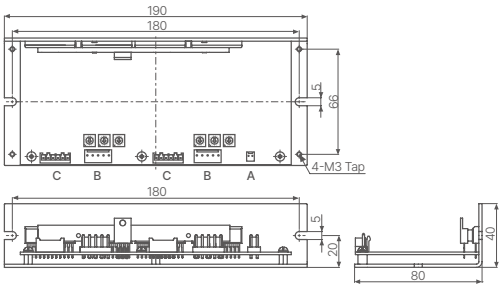
01) If a power supply is over 30 VDC⎓, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area. The torque may vary depending on power supply.
02) Based on ambient temp. 25°C, ambient humi. 55%RH
03)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

Vibration	MD5-HD14-2X	MD5-HD14-3X
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)

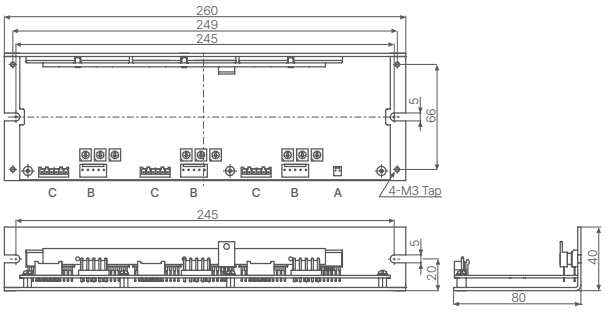
Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

■ **MD5-HD14-2X**



■ **MD5-HD14-3X**



5-Phase Stepper Motor and Driver Specifications

(○ : General specifications, ◎ : High-speed, High-torque specifications)

Motor					Driver		
Frame size	Type	Model	Torque (kgf·cm)	Rated current (A/Phase)	MD5-HD14/MD5-ND14 / MD5-HD14-2X(3X)	MD5-HF14/ MD5-HF14-AO	MD5-HF28
24mm	Shaft type	02K-S523(W)	0.18	0.75	○	◎	–
		04K-S525(W)	0.28	0.75	○	◎	–
42mm	Shaft type / Shaft + Built-in brake type	A1K-S543(W)-□	1.3	0.75	○	◎	–
		A2K-S544(W)-□	1.8	0.75	○	◎	–
		A2K-M544(W)	1.8	1.4	○	◎	–
		A3K-S545(W)-□	2.4	0.75	○	◎	–
	Hollow shaft type	AH1K-S543	1.3	0.75	○	◎	–
		AH2K-S544	1.8	0.75	○	◎	–
		AH3K-S545	2.4	0.75	○	◎	–
	Geared type/ Geared + Built-in brake type	A10K-S545(W)-G□5	10	0.75	○	◎	–
		A15K-S545(W)-G□7.2	15	0.75	○	◎	–
		A15K-S545(W)-G□10	15	0.75	○	◎	–
60mm	Shaft type / Shaft + Built-in brake type	A4K-S564(W)-□	4.2	0.75	○	◎	–
		A4K-M564(W)-□	4.2	1.4	○	◎	–
		A4K-G564(W)	4.2	2.8	–	–	◎
		A8K-S566(W)-□	8.3	0.75	○	◎	–
		A8K-M566(W)-□	8.3	1.4	○	◎	–
		A8K-G566(W)	8.3	2.8	–	–	◎
		A16K-M569(W)-□	16.6	1.4	○	◎	–
		A16K-G569(W)-□	16.6	2.8	–	–	◎
	Hollow shaft type	AH4K-S564(W)	4.2	0.75	○	◎	–
		AH4K-M564(W)	4.2	1.4	○	◎	–
		AH8K-S566(W)	8.3	0.75	○	◎	–
		AH8K-M566(W)	8.3	1.4	○	◎	–
		AH16K-M569(W)	16.6	1.4	○	◎	–
		AH16K-G569(W)	16.6	2.8	–	–	◎
	Geared type/ Geared + Built-in brake type	A35K-M566(W)-G5□	35	1.4	○	◎	–
		A40K-M566(W)-G□7.2	40	1.4	○	◎	–
		A50K-M566(W)-G□10	50	1.4	○	◎	–
	Rotary actuator type/ Rotary actuator + Built-in brake type	A35K-M566(W)-R□5	35	1.4	○	◎	–
		A40K-M566(W)-R□7.2	40	1.4	○	◎	–
		A50K-M566(W)-R□10	50	1.4	○	◎	–
85mm	Shaft type / Shaft + Built-in brake type	A21K-M596(W)-□	21	1.4	○	◎	–
		A21K-G596(W)-□	21	2.8	–	–	◎
		A41K-M599(W)-□	41	1.4	○	◎	–
		A41K-G599(W)-□	41	2.8	–	–	◎
		A63K-M5913(W)-□	63	1.4	○	◎	–
		A63K-G5913(W)-□	63	2.8	–	–	◎
	Hollow shaft type	AH21K-M596(W)	21	1.4	○	◎	–
		AH21K-G596(W)	21	2.8	–	–	◎
		AH41K-M599(W)	41	1.4	○	◎	–
		AH41K-G599(W)	41	2.8	–	–	◎
		AH63K-M5913(W)	63	1.4	○	◎	–
		AH63K-G5913(W)	63	2.8	–	–	◎
	Geared type/ Geared + Built-in brake type	A140K-M599(W)-G□5	140	1.4	○	◎	–
		A140K-G599(W)-G□5	140	2.8	–	–	◎
		A200K-M599(W)-G□7.2	200	1.4	○	◎	–
		A200K-G599(W)-G□7.2	200	2.8	–	–	◎
		A200K-M599(W)-G□10	200	1.4	○	◎	–
		A200K-G599(W)-G□10	200	2.8	–	–	◎

※ (W) stands for dual shaft of motor. (The built-in brake type provides single shaft type only.)

※ The motor torque has a big difference in torque by the characteristics of the driver. Please refer to the graph in this catalogue that shows the characteristics of motors and drivers. For MD5-HD14, MD5-HD14-2X(3X), MD5-ND14, the high-speed region torque characteristics are better at 35VDC than at 20VDC. In addition, MD5-HF14 and MD5-HF28 have further improved torque characteristics in the high-speed area than using DC type driver.

2-Phase Stepper Motor Drivers

MD2U Series

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

MD	2	U	-	❶	D	20

❶ Step method (resolution)

M: Micro Step (20-division)
I: Intelligent type

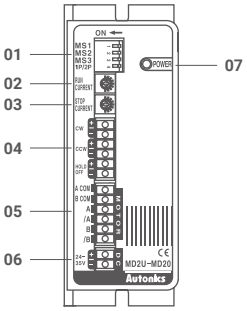
Specifications

Basic step angle	MD2U-MD20	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	
Basic step angle	1.8° / Step	
Max. RUN speed	-	1500 rpm
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)	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)	≈ 180 g (≈ 295 g)	≈ 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. 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.

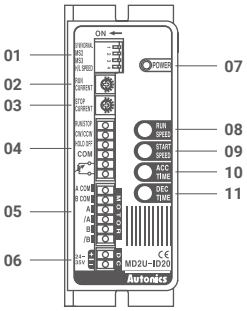
Unit Descriptions

■ **MD2U-MD20**



01. Function selection DIP switch
02. RUN current setting rotary switch
03. Stop current setting rotary switch
04. Input terminal
05. Motor terminal
06. Power terminal
07. Power indicator

■ **MD2U-ID20**

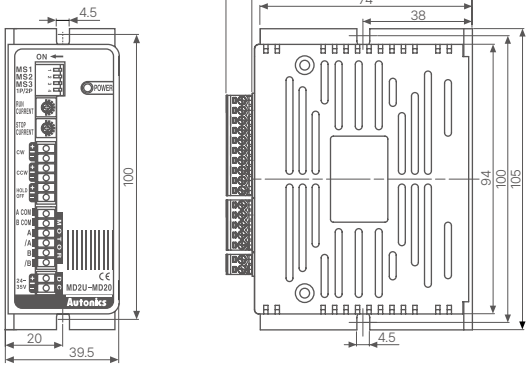


01. Function selection DIP switch
02. RUN current setting rotary switch
03. Stop current setting rotary switch
04. Input terminal
05. Motor terminal
06. Power terminal
07. Power indicator
08. RUN speed setting rotary switch
09. Start speed Setting rotary switch
10. Acceleration time setting rotary switch

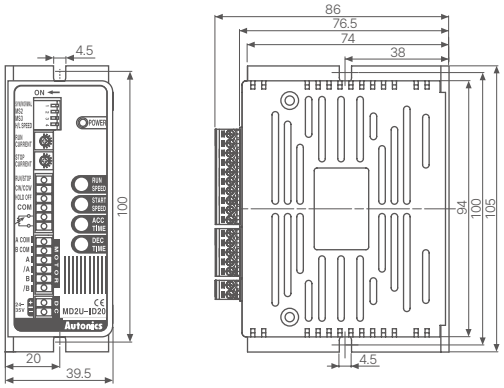
Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

■ **MD2U-MD20**



■ **MD2U-ID20**



Motion Controllers

Motion controllers are devices that generate pulse signals to control the motor driver. Motion controllers convert movement into pulse signals for controlling the rotation angle and speed and send signals to drivers.
Autonics provides stand-alone type and PCI card type motion controllers.

Controllers

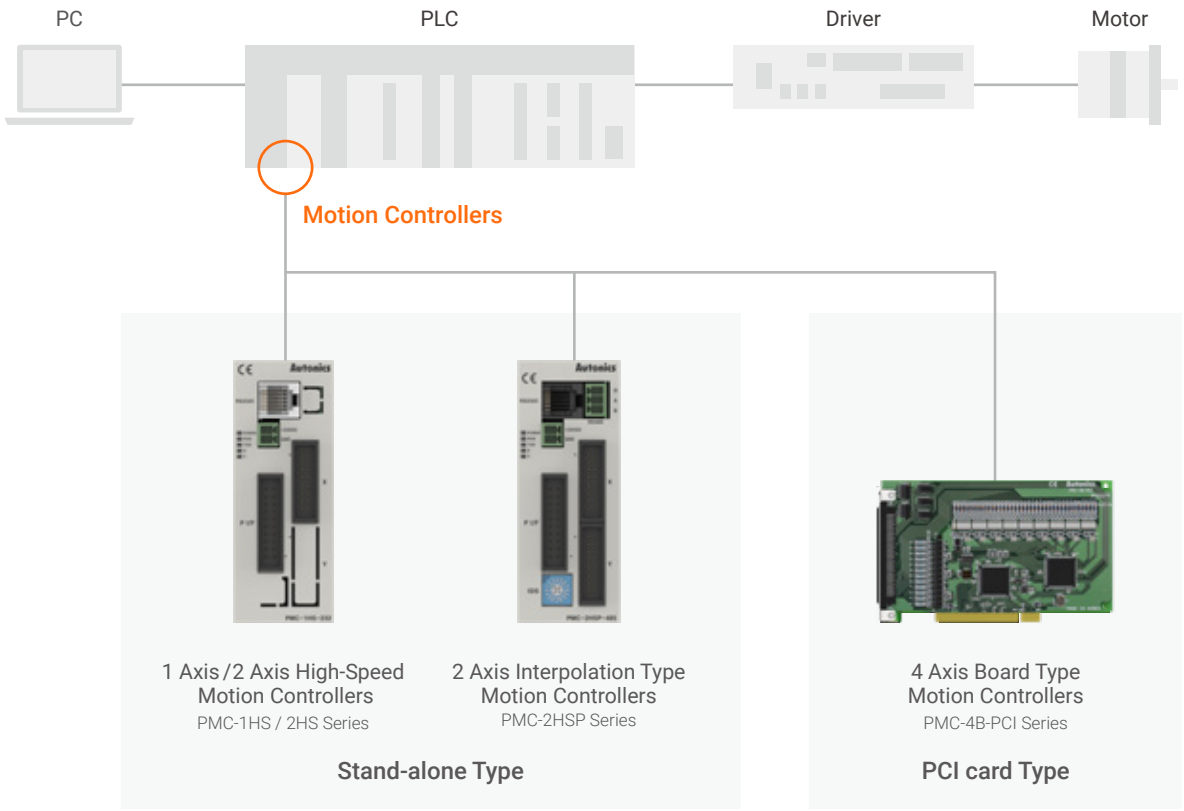
· **Stand-alone** | PMC-1HS / 2HS Series, PMC-2HSP Series
· **PCI card** | PMC-48-PCI Series


Autonics
RS232C
G
A
B
RS485
+24VDC
GND
POWER
RXD
TXD
X
Y
X
P I/F
Y
IDS
PMC-2HSP-485

Autonics
Motion Controllers

1. Various Lineup

Autonics motion controllers include a stand-alone type and a PCI card type.
Stand-alone type can be controlled by a PC and no need for separate host devices.
PCI card type is installed in the PC and can be used in various ways with different environments.



2. 4 Operation Modes

Autonics provides 4 operation modes. (Jog / Continuous / Index / Program)

Jog Mode

Outputting drive pulses in the + or – direction while the input signal is ON.

Continuous Mode

Outputting pulses continuously in the designated direction while the drive signal is activated.

Index Mode

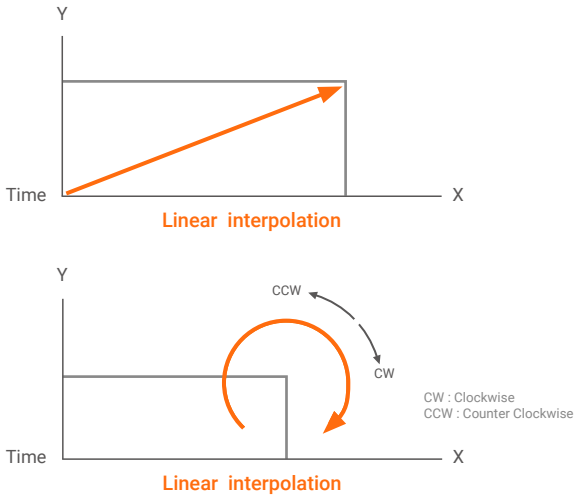
Operating one step among demands stored in the program.

Program Mode

Operating the designated programs.

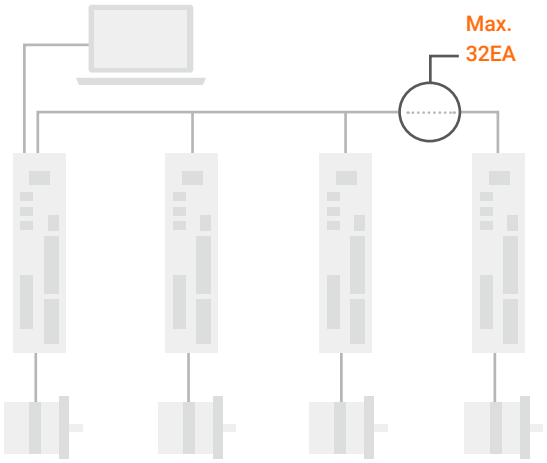
3. Linear and Circular Interpolation Control

2 Axis interpolation type motion controllers can control two axes at the same time using linear or circular interpolation functions. This type allows for drawing accurate straight lines and circular arcs.



4. Controlling up to 32 Axes via RS485 Communication

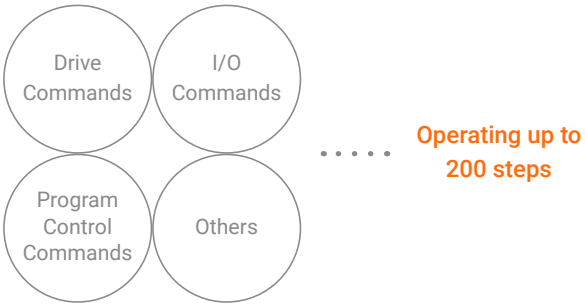
2 Axis interpolation type motion controllers can control multi-axis via RS485 communication up to 16 units (32 axes). Each product can be connected to PCs and controlled with corresponding communication, and as a stand-alone type, it can be controlled by I/O and teaching unit.



5. Operating up to 200 Steps

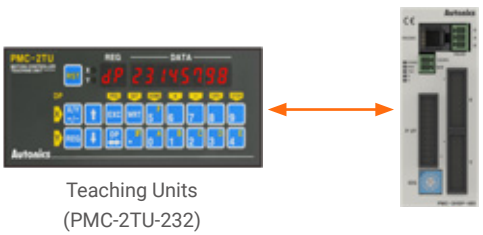
2 Axis Interpolation Type Motion Controllers can realize a wide variety of operations up to 200 steps using 17 control commands combination (drive, I/O, program control commands, etc.) through program mode.

* In the case of the PMC-1HS/2HS series, 64-step operation is available by 12 command combinations.



6. Available Monitoring

1 Axis/2 Axis High-Speed Programmable Motion Controllers can set and monitor operation mode, parameter and operation program without a PC using the teaching unit (PMC-2TU-232).



Teaching Units
(PMC-2TU-232)

1 Axis / 2 Axis
Motion Controllers

PMC-1HS / PMC-2HS Series

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

PMC	-	❶	-	❷

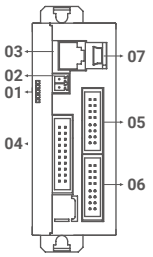
❶ Axis / Type
1HS: 1 axis high speed stand alone
2HS: 2 axis high speed stand alone

❷ Communication type
232: RS232C
USB: USB / RS232C

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)

Unit Descriptions

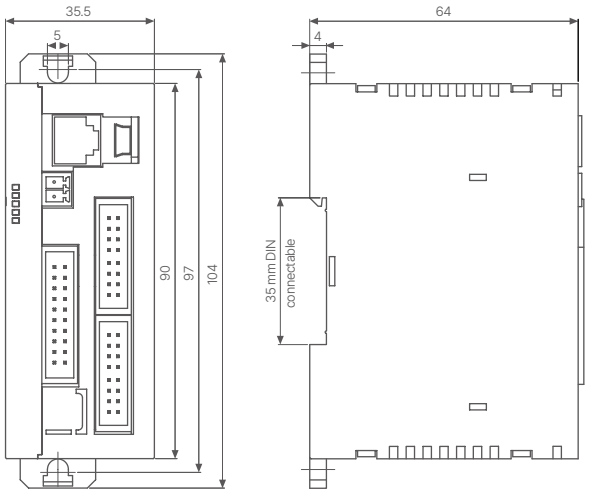


01. Power / Status indicator
02. Power connector (CN1)
03. RS232C comm. connector (CN2)
04. Parallel I/F connector (CN3)
05. X axis I/O connector (CN4)
06. Y axis I/O connector (CN5) 01)
07. USB comm. connector (CN6) 02)

01) The corresponding connector is only available on PMC-2HS-□.
02) The corresponding connector is only available on PMC-□-USB.

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.



Sold Separately

[Teaching Unit]
PMC-2TU-232

* Refer to p.78 for information on separately sold items

2 Axis
Motion Controllers

PMC-2HSP Series

Ordering Information

This is only for reference, the actual product does not support all combinations..
For selecting the specified model, follow the Autonics website.

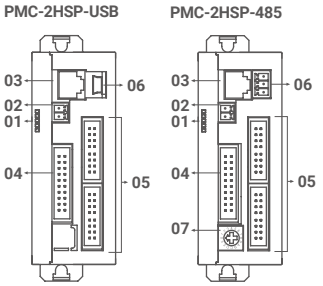
PMC	-	2HSP	-	❶

❶ Communication type
USB: USB / RS232C
485: RS485 / RS232C

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)

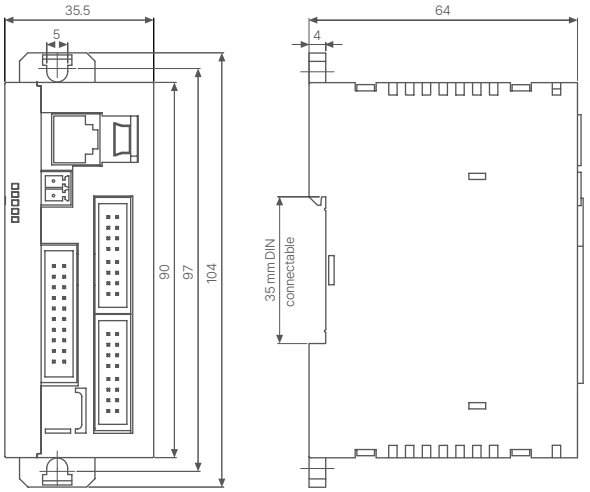
Unit Descriptions



01. Power / Status indicator
02. Power connector (CN1)
03. RS232C comm. connector (CN2)
04. Parallel I/F connector (CN3)
05. X, Y axis I/O connector (CN4, 5)
06. USB / RS485 comm. connector (CN6)
07. ID select rotary switch

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.



4 Axis Board Type
Motion Controllers

PMC-4B-PCI Series

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)

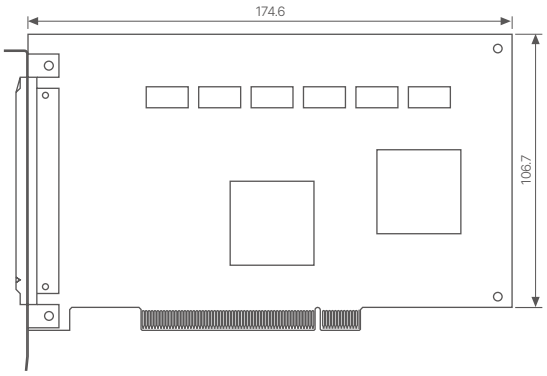
2/3 axis linear interpolation range	-2,147,483,648 to +2,147,483,647 for each axi
2/3 axis linear interpolation speed	1 pps ~ 4 Mpps
2/3 axis linear interpolation position accuracy	≤ ±0.5 LBS (within all interpolation range)
2/3 axis bit pattern interpolation speed	1 pps to 4 Mpps (depending on CPU data setup time)
Circular interpolation range	-2,147,483,648 to +2,147,483,647 for each axis
Circular interpolation speed	1 pps ~ 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)

Drive pulse output (X, Y axis common)	
Output speed range	1 pps ~ 4 Mpps
Output speed accuracy	≤ ± 0.1% (for setting value)
Speed magnification	1 ~ 500
S jerk speed	954 to 62.5×106 pps / sec (magnification = 1)
Accel/Decel increase rate	477×103 to 31.25×109 pps/sec (magnification = 500)
Accel/ Deceleration	125 to 1×106 pps / sec (magnification = 1) 62.5×103 to 500×106 pps / sec (magnification = 500)
Initial velocity	1 to 8,000 pps (magnification = 1) 500 to 4×106 pps (magnification = 500)
Drive speed	1 to 8,000 pps (magnification = 1) 500 to 4×106 pps (magnification = 500)
No. of output pulse	0 to 4,294,967,295 (fixed pulse drive)
Speed curve	Constant speed, Symmetric/Asymmetric linear accel / deceleration, parabola S curve drive
Fixed pulse drive deceleration mode	Auto deceleration (asymmetric linear Accel/Deceleration) / Manual deceleration
Others	Changing output pulse, drive speed while driving Select individual 2 pulse / 1 pulse direction method Select drive pulse logic level Changing output terminal

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.



Motion Devices Software atMotion

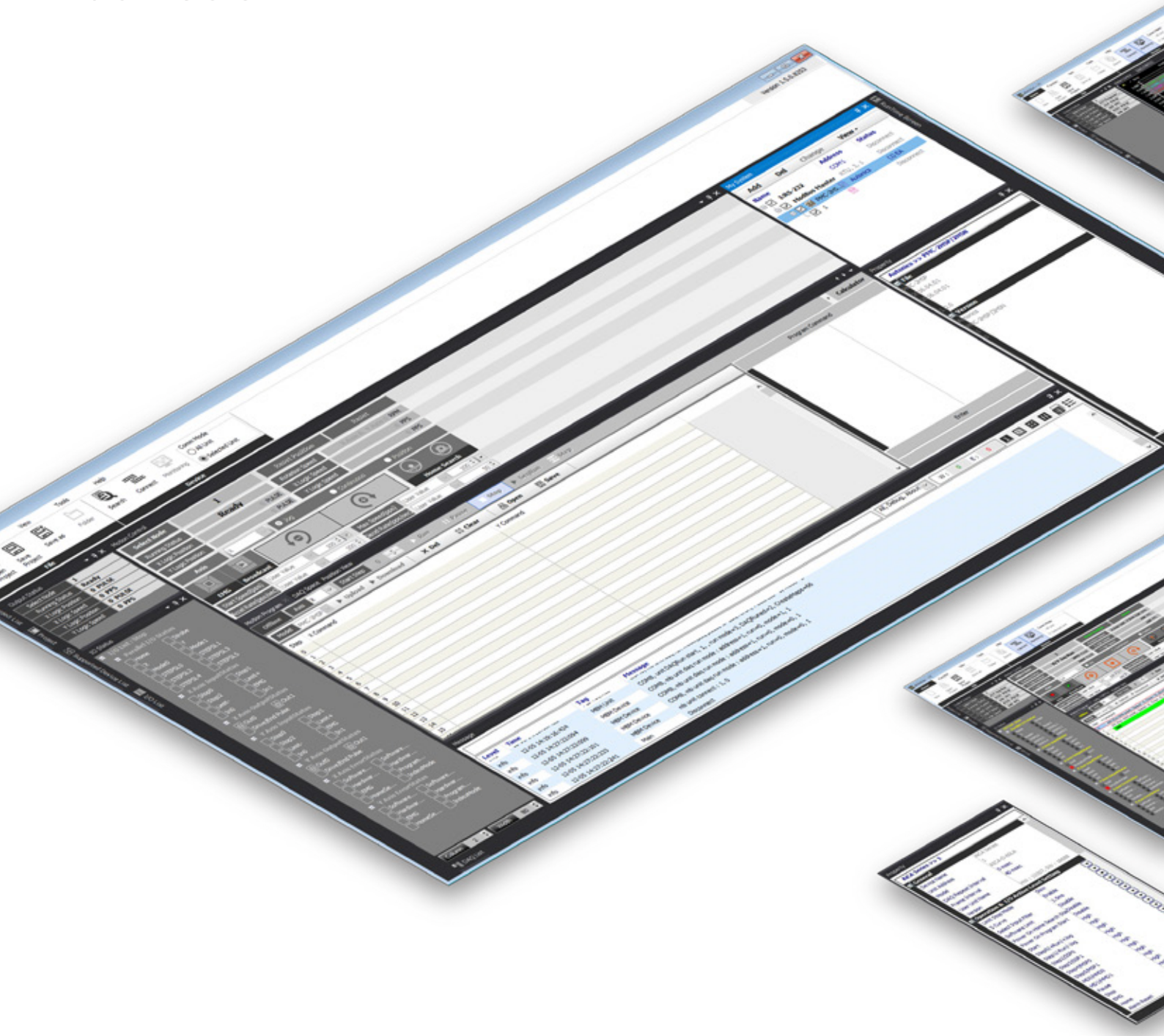
atMotion is a comprehensive motion control management software for managing Autonics motion devices. The user-friendly GUI provided in the software allows users to easily configure parameters and monitor operation status and data logs.

Software

· Motion Devices Software | atMotion


Version 1.5.0.8253
My System
Add
Del
Change
View
Name
Address
Status
RS-232
COM1
Disconnect
Modbus Master
RTU, 3, 1
Disconnect
Autonics
Disconnect
Property
Autonics >> PHC-2HSP/2HSN
File
Version
Calculator
Command
Enter
atMotion

Autonics Software
atMotion



Supports Multiple Devices

- Monitor operation status of multiple devices and set parameters for each device.
- When multiple units with different addresses are connected, the address scan function provides unit auto search.

Simple Graphic User Interface

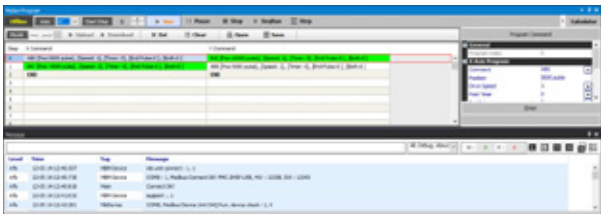
- Freely edit screen data to set parameters, monitor devices, and program control.
- Monitor operation status and history using DAQ Space (Line Graph, Grid).
- Print address map reports of registered devices.

Multilingual Support

- English and Korean are supported by default, and users can easily add other languages.

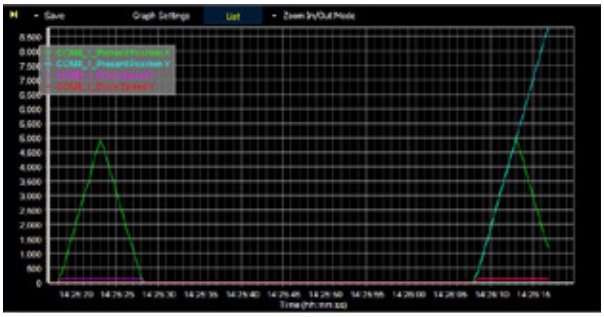
1. Motion Control and Parameter Settings

The intuitive graphic user interface allows users to easily set parameters for controlling connected motion devices.



2. DAQ Space

Users can monitor runtime screen in line graph and grid formats.



3. Compatible Devices with atMotion Software

Compatible Software	Programming	Parameter Setting / Monitoring	Previous Software
PMC-2HSP/2HSN Series	○	○	Motion Studio
PMC-1HS/2HS Series	○	○	PMC-HS Program
PMC-48-PCI Series	○	○	I/O Test Program
AiC Series	○	○	-
AiCA Series	○	○	-
AiC-CL Series	X	○	-
AiC-EC Series	X	○	-
AiCA-EC Series	X	○	-

Sold Separately

Model	Power Cable	I/O Cable	Motor + Encoder Cable
AiS Series	CJ-PW-□	[Standard Type] CO20-MP□-R (specifications: Series TAG) E.g) AiC-CL: CO20-MP□-R (specifications: AiC-CL Series TAG) [Connector Type] CH20-MP□-8R ※ It can be used in connection with the Autonics interface terminal block.	[Motor+Encoder Cable] - Fixed Type: C1D14M(B)-□ - Flexible Type: C1DF14M(B)-□ ※ (B): Brake
AiSA Series	-		
AiC-EC Series	CJ-PW-□		
AiCA-EC Series	-		
AiC-CL Series	CJ-PW-□		
AiC Series	CJ-PW-□	[Standard Type] CO50-MP□-R (specifications: Series TAG) E.g) AiC-CL: CO50-MP□-R (specifications: AiC TAG) [Connector Type] CH50-MP□-8R ※ It can be used in connection with the Autonics interface terminal block.	
AiCA Series	-		

[Power Cable]

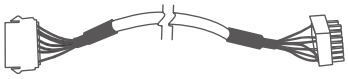
CJ-PW-□

- Recommended to use ferrite core at both ends of the cable.
- The model name is 010, 020 which indicates the cable length.
  E.g.) CJ-PW-010: 1 m power cable

[Motor + Encoder Cable]

Fixed type : C1D14M(B)-□

Flexible type : C1DF14M(B)-□



- Recommended to use ferrite core at both ends of the cable.
- The model name is 1, 2, 3, 5, 7, 10, 15, 20 which indicates the cable length. E.g.) C1DF14M-10: 10 m flexible type, Motor + Encoder cable
- For built-in brake type, use dedicated cable.
  (fixed type: C1D14MB-□, moving type: C1DF14MB-□)

[I/O Cable]

- Standard Type

CO20-MP□-R (specifications: AiS TAG)

Pin	Function (Name TAG)	Cable color	Dot line color-number
1	CW+	Yellow	Black-1
2	CW-		Red-1
3	CCW+		Black-2
4	CCW-		Red-2
5	Servo ON/OFF+		Black-3
6	Servo ON/OFF-		Red-3
7	Alarm Out+		Black-4
8	Alarm Out-		Red-4
9	Alarm Reset+		Black-5
10	Alarm Reset-		Red-5
11	In-Position+	White	Black-1
12	In-Position-		Red-1
13	Brake+		Black-2
14	Brake-		Red-2
15	Encoder A		Black-3
16	Encoder $\overline{A}$		Red-3
17	Encoder B		Black-4
18	Encoder $\overline{B}$		Red-4
19	Encoder Z		Black-5
20	Encoder $\overline{Z}$		Red-5

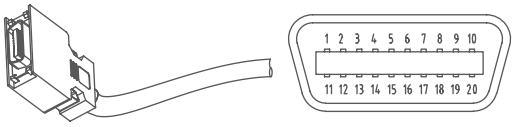
- Recommended to use ferrite core at both ends of the cable.
- The model name is 010, 020, 030, 050, 070, 100, 150, 200 which indicates the cable length.
  E.g.) CO20-MP070-R: 7 m I/O cable

CO20-MP□-R (Specifications: AiC-EC TAG)

Pin	Function (Name TAG)	Cable Color	Dot line color-number
1	VEX	Yellow	Black-1
2	ORG		Red-1
3	+Limit		Black-2
4	-Limit		Red-2
5	Alarm Reset		Black-3
6	Hold Off		Red-3
7	Stop		Black-4
8	EMG		Red-4
9	IN1		Black-5
10	IN2		Red-5
11	IN3	White	Black-1
12	IN4		Red-1
13	IN5		Black-2
14	In-Position		Red-2
15	Alarm		Black-3
16	OUT1		Red-3
17	OUT2		Black-4
18	OUT3		Red-4
19	OUT4		Black-5
20	GEX		Red-5

- Recommended to use ferrite core at both ends of the cable.
- The model name is 010, 020, 030, 050, 070, 100, 150, 200 which indicates the cable length.
  E.g.) CO20-MP070-R: 7 m I/O cable

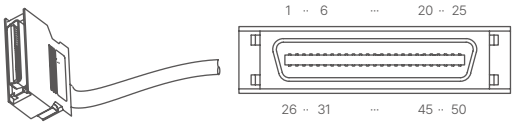
CO20-MP□-R (specifications: AiC-CL TAG)



Pin	Function (Name TAG)	Cable color	Dot line color-nubmer
1	VEX	Yellow	Black-1
2	IN0		Red-1
3	IN1		Black-2
4	IN2		Red-2
5	IN3		Black-3
6	IN4		Red-3
7	IN5		Black-4
8	IN6		Red-4
9	IN7		Black-5
10	ORG		Red-5
11	+Limit	White	Black-1
12	-Limit		Red-1
13	OUT0		Black-2
14	OUT1		Red-2
15	OUT2		Black-3
16	OUT3		Red-3
17	OUT4		Black-4
18	OUT5		Red-4
19	OUT6		Black-5
20	GEX		Red-5

- Recommended to use ferrite core at both ends of the cable.
- The model name is 010, 020, 030, 050, 070, 100, 150, 200 which indicates the cable length.
  E.g.) CO20-MP070-R: 7 m I/O cable

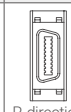
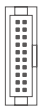
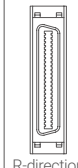
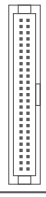
CO50-MP□-R (specifications: AiC TAG)



Pin	Function (Name TAG)	Cable Color	Dot line color-number	Pin	Function (Name TAG)	Cable Color	Dot line color-number
1	N·C	Orange	Black-1	26	IN0	White	Red-3
2	N·C		Red-1	27	IN1		Black-4
3	Reset		Black-2	28	IN2		Red-4
4	Start		Red-2	29	N·C		Black-5
5	Stop		Black-3	30	IN3		Red-5
6	EMG		Red-3	31	IN4	Gray	Black-1
7	Step0/+Run/+Jog		Black-4	32	IN5		Red-1
8	Step1/-Run/-Jog		Red-4	33	IN6		Black-2
9	Step2/SSP0		Black-5	34	IN7		Red-2
10	Step3/SSP1		Red-5	35	IN8, Brake ON/OFF		Black-3
11	Step4/MSP0	Yellow	Black-1	36	VEX		Red-3
12	Step5/MSP1		Red-1	37	GEX		Black-4
13	MD0/HMD0		Black-2	38	Alarm		Red-4
14	MD1/HMD1		Red-2	39	Compare1 (Trigger)		Black-5
15	Pause		Black-3	40	Compare2(Trigger)		Red-5
16	Servo ON/OFF		Red-3	41	OUT0	Pink	Black-1
17	Home		Black-4	42	OUT1		Red-1
18	Alarm Reset		Red-4	43	OUT2		Black-2
19	+Limit		Black-5	44	OUT3		Red-2
20	-Limit		Red-5	45	OUT4		Black-3
21	ORG	White	Black-1	46	OUT5		Red-3
22	SD		Red-1	47	OUT6		Black-4
23	In-Position		Black-2	48	OUT7		Red-4
24	VEX		Red-2	49	OUT8		Black-5
25	GEX		Black-3	50	OUT9		Red-5

- Recommended to use ferrite core at both ends of the cable.
- The model name is 010, 020, 030, 050, 070, 100, 150, 200 which indicates the cable length.
  E.g.) CO50-MP070-R: 7 m I/O cable

- Connector Type

SERVO connector		Cable model	Cable appearance	Terminal block Type Direction connector
Type	Direction			
3M 20-pin plug (latch)	 R-direction	CH20-MP□-□R		
3M 50-pin plug (latch)	 R-direction	CH50-MP□-□R		

[Flexible Shaft Couplings]
ERB Series

The ERB series flexible couplings are high-strength aluminum alloy (AL7075-T6) beam couplings with high elasticity. The couplings have zero backlash, providing accurate transmission of torque between shafts. The surface is treated with alumite for high corrosion resistance. The ERB series is available in clamp type and screw type connection and Ø19 mm and Ø26 mm outer diameter sizes.

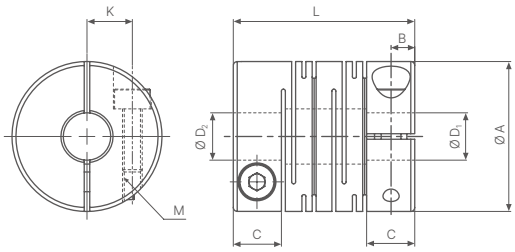
Specifications

Model	ERB-A-19C-☐	ERB-A-19S-☐	ERB-A-26C-☐	ERB-A-26S-☐
Connection type	Clamp	Set screw	Clamp	Set screw
Max. revolution	8,000 rpm	20,000 rpm	6,000 rpm	15,000 rpm
Max. torque	1.2 N m		3.0 N m	
Rated torque	0.6 N m		1.5 N m	
Mounting bolt (mounting torque)	M2.5 (1 N m)	M3 (0.7 N m)	M3 (0.7 N m)	M4 (1.7 N m)
Torsional stiffness	140 N m / rad		240 N m / rad	
Inertia moment	6.4×10^{-7} kg·m^2		3.4×10^{-6} kg·m^2	
Max. allowable misalignment	Angular misalignment: ≤ 2.5° Parallel misalignment: ≤ 0.15 mm End-play: ≤ ± 0.3 mm		Angular misalignment: ≤ 2.5° Parallel misalignment: ≤ 0.2 mm End-play: ≤ ± 0.4 mm	
Standard bore diameter (tolerance h7)	Ø 4, Ø 5, Ø 6 mm		Ø 6, Ø 8 mm	
Max. allowable diameter	Ø 4 ~ 8 mm		Ø 5 ~ 12 mm	
Material	Aluminum (AL 7075-T6), Alumite surface			
Unit weight (packaged)	≈ 14.4 g (≈ 14.9 g)		≈ 36.7 g (≈ 37.3 g)	

Dimensions

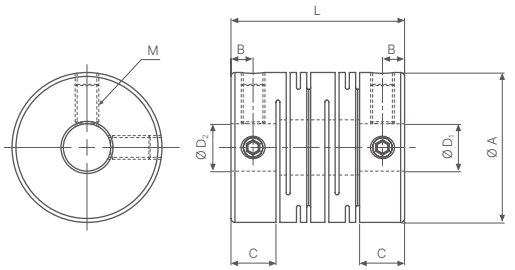
- Unit: mm, For the detailed drawings, follow the Autonics website.

■ Clamp Type



Model	Ø A	L	Ø D_1	Ø D_2	M	C	B	K
ERB-A-19C-04/04	19	23	4 +0.018 0	4 +0.018 0	M2.5	6.1	3	5.75
ERB-A-19C-04/05				5 +0.018 0				
ERB-A-19C-04/06				6 +0.018 0				
ERB-A-19C-05/05	19	23	5 +0.018 0	5 +0.018 0				
ERB-A-19C-05/06				6 +0.018 0				
ERB-A-19C-06/06	19	23	6 +0.018 0	6 +0.018 0				
ERB-A-26C-06/06	26	31.4	6 +0.018 0	6 +0.018 0	M3	7.4	3.7	8.55
ERB-A-26C-06/08				8 +0.018 0				
ERB-A-26C-08/08	26	31.4	8 +0.018 0	8 +0.018 0				

■ Set Screw Type



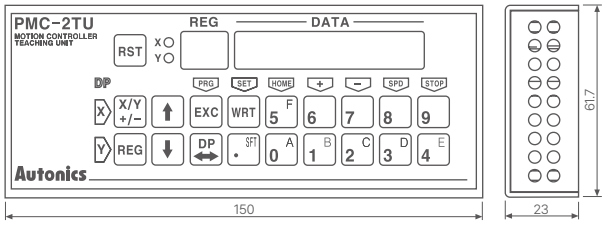
Model	Ø A	L	Ø D_1	Ø D_2	M	C	B
ERB-A-19S-04/04	19	22	4 +0.018 0	4 +0.018 0	M3	5.7	2.8
ERB-A-19S-04/05				5 +0.018 0			
ERB-A-19S-04/06				6 +0.018 0			
ERB-A-19S-05/05	19	22	5 +0.018 0	5 +0.018 0			
ERB-A-19S-05/06				6 +0.018 0			
ERB-A-19S-06/06	19	22	6 +0.018 0	6 +0.018 0			
ERB-A-19S-06/08				8 +0.018 0			
ERB-A-26S-06/06	26	30	6 +0.018 0	6 +0.018 0	M4	6.8	3.4
ERB-A-26S-06/08				8 +0.018 0			
ERB-A-26S-06/10				10 +0.018 0			
ERB-A-26S-06/12				12 +0.018 0			
ERB-A-26S-08/08	26	30	8 +0.018 0	8 +0.018 0			

[Teaching Unit]
PMC-2TU-232

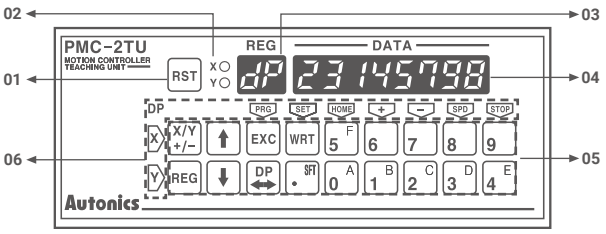
The teaching unit (PMC-2TU-232) is a device that builds the operation program for the main body without a PC. In addition, it can carry out the start of the operation program, the home search and jog operation. The teaching unit is used by connection the private cable (1.5m) to the RS-232C connector (CN2) of the main body.

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.



Unit Descriptions



01. Reset
Reset the controller and teaching unit.

02. X/Y display
Display the currently selected axis.

03. Register number display/dp
Displays the currently selected register number when data is editing and dp when operating drive.

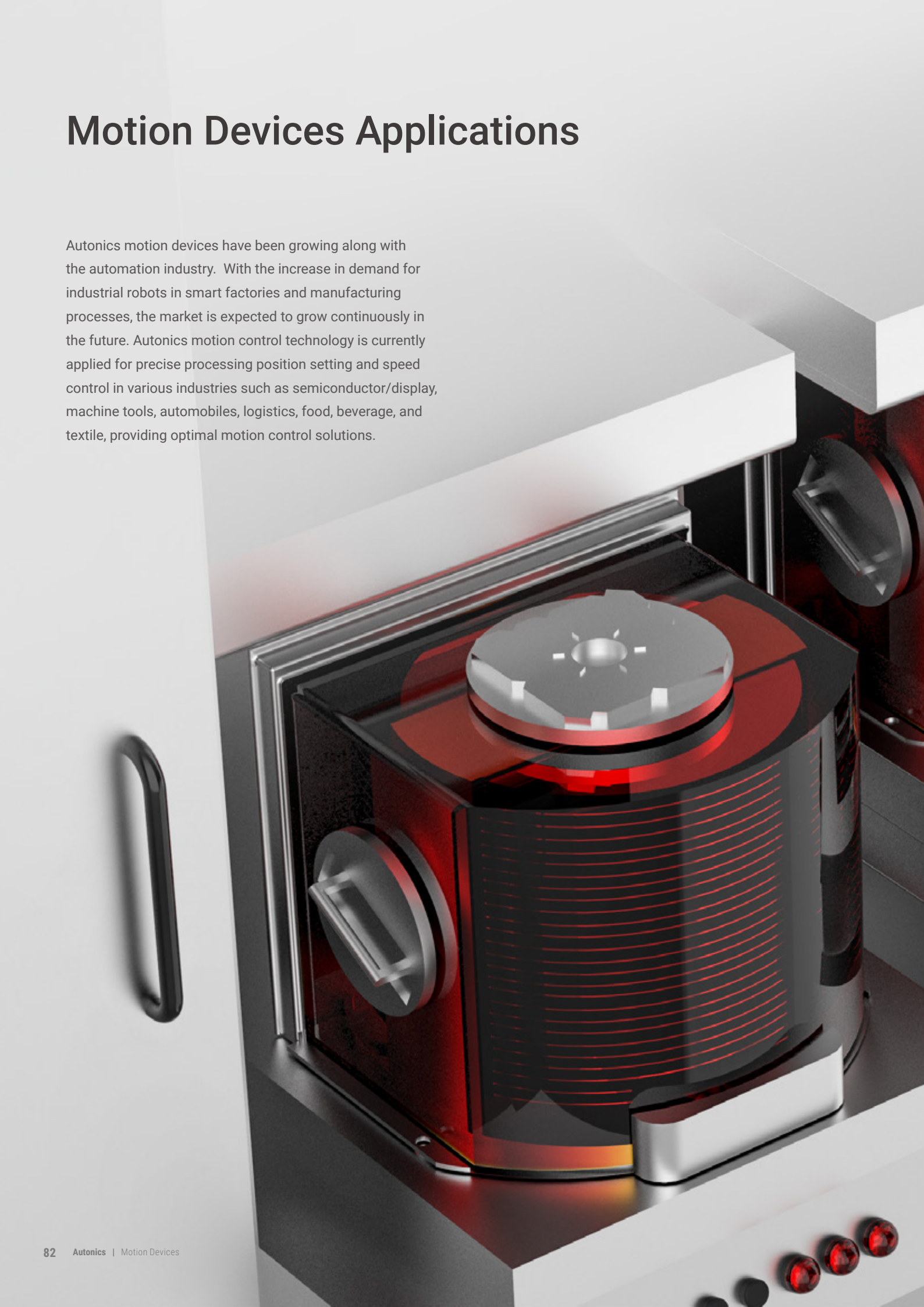
04. Data display
Displays the data of each register when data is editing and the current position of the selected axis when operating drive.

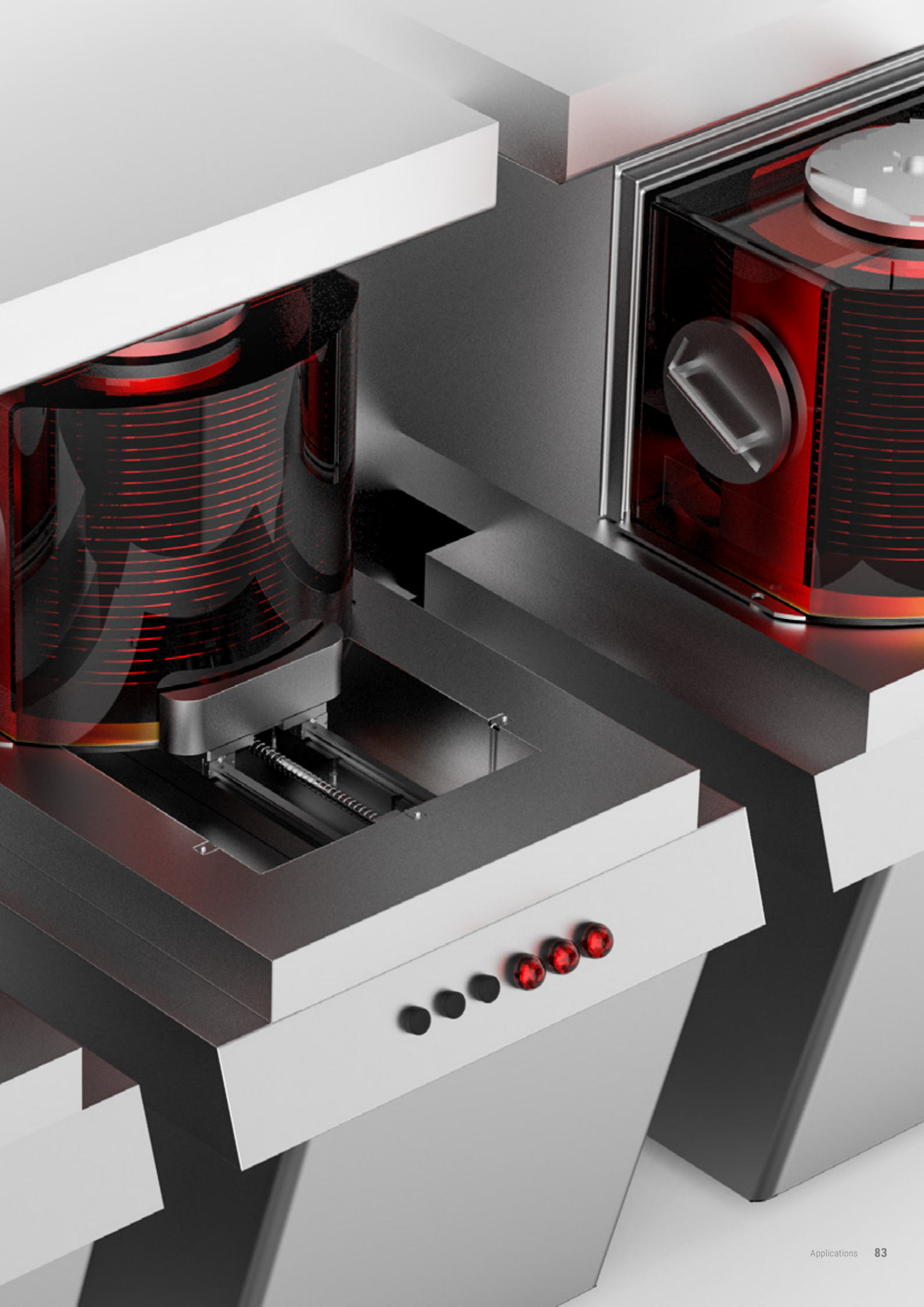
05. Input button
X/Y: Converts the selecting axis. It is used to convert the sign of an input value when the value is entered and a mode data that the mode data is entered.
REG: It is used to input the register number to display.
If this button is pressed on the data input, the data input is canceled and returns to the state before the data input.
↑↓: Increases / decreases the displayed register number.
EXC: Runs the displayed command. However, this command is only valid for ABS, INC, OUT, OTP and HOM 1 to 4 commands.
DP: Converts the drive handling status and the data edit status.
WRT: Adds a value when data is editing.

06. Button display for drive operation
Displays button function as yellow letters to the left or the top of the input button in drive handling status. The top end and the bottom end of the button handle X-axis and Y-axis respectively.

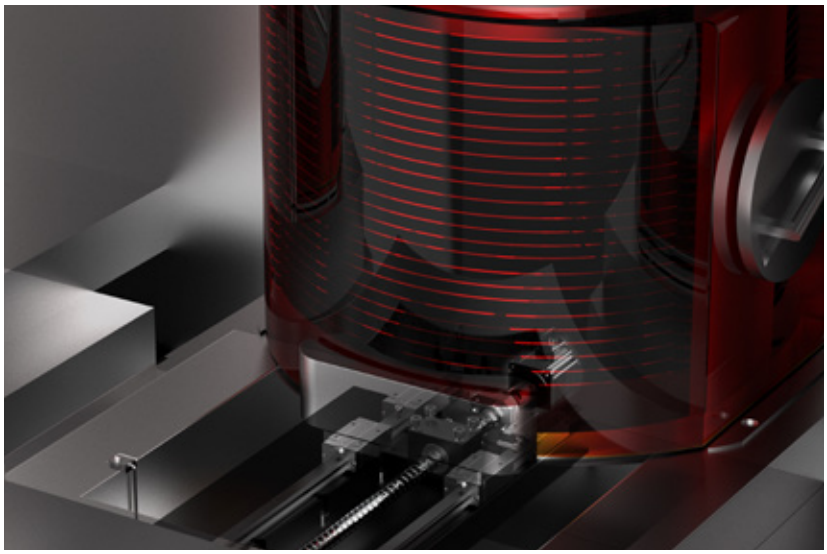
Motion Devices Applications

Autonics motion devices have been growing along with the automation industry. With the increase in demand for industrial robots in smart factories and manufacturing processes, the market is expected to grow continuously in the future. Autonics motion control technology is currently applied for precise processing position setting and speed control in various industries such as semiconductor/display, machine tools, automobiles, logistics, food, beverage, and textile, providing optimal motion control solutions.



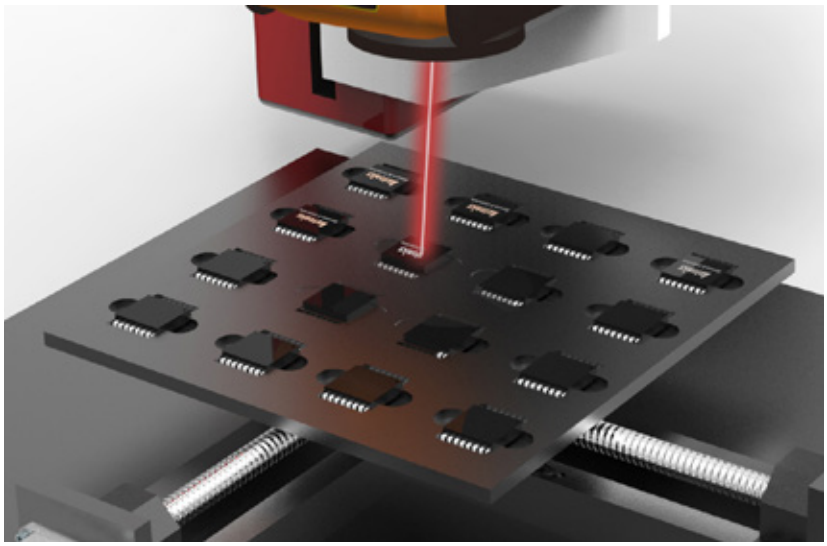


1. Semiconductor / Display Industry



1-1.
Wafer Cassette Transfer Machine

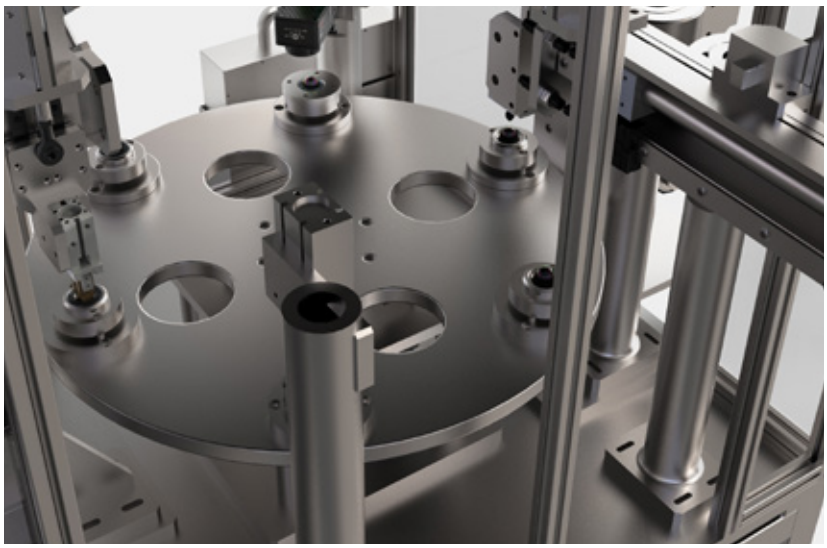
Closed loop stepper motor system is used to control movement and location of wafer cassettes in semiconductor transfer machines.



1-2.
Laser Marking on Semiconductor Parts

Stepper motors are used to move and control X-Y axis location of trays during laser marking of semiconductor parts.

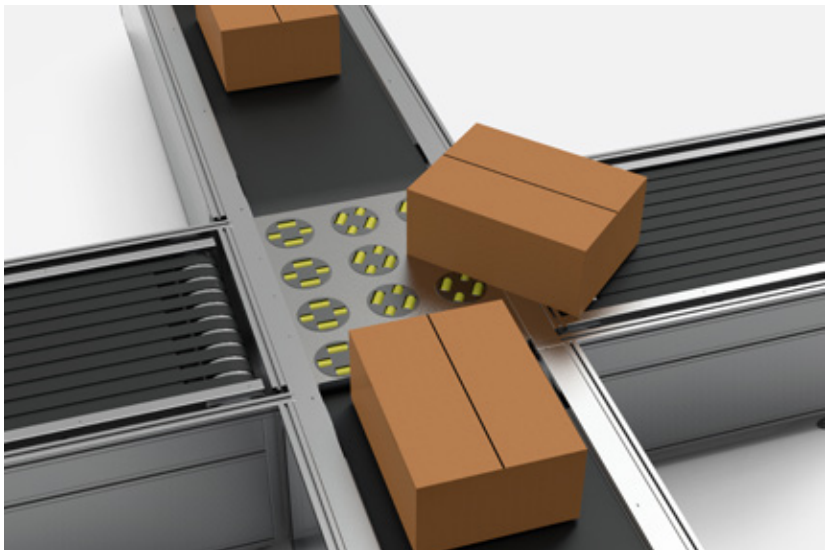
2. Automobile Industry



2-1.
Camera Module Inspection Machine

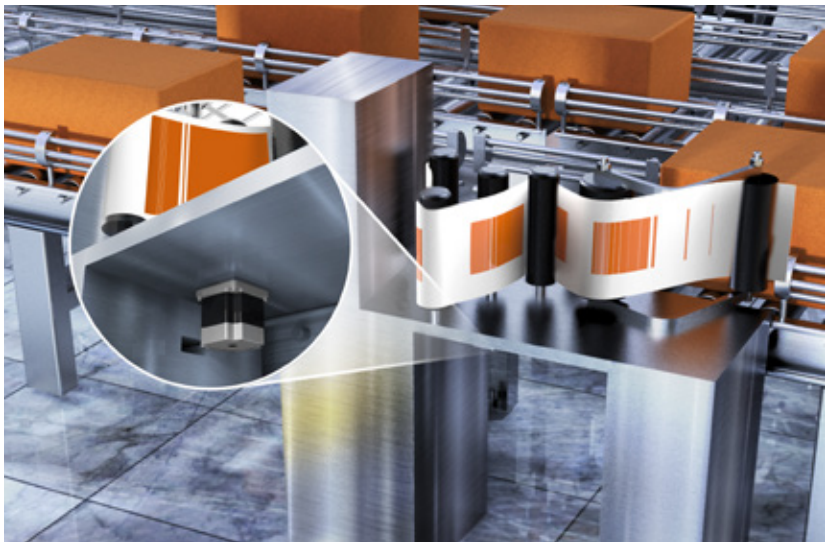
Closed loop stepper motor system is used to control movement and location of tables in camera module inspection machines.

3. Logistics Industry



3-1.
Sorters

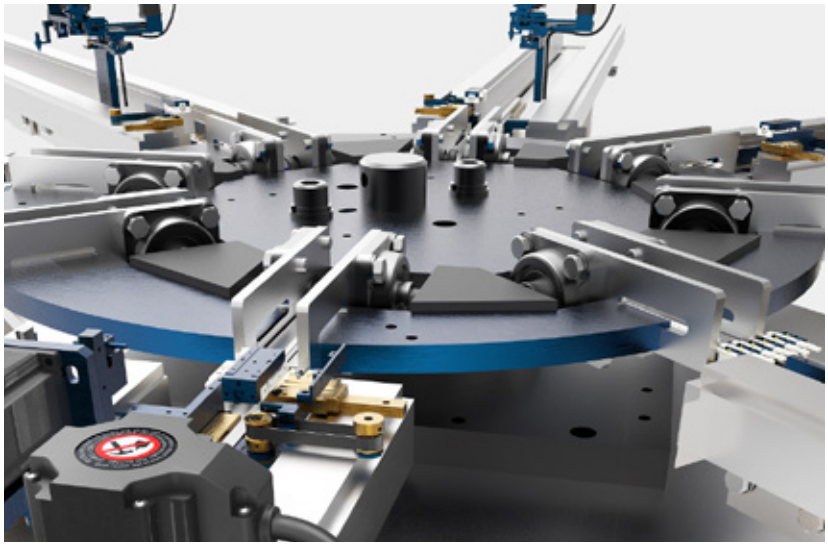
Stepper motors are used in automatic sorters to sort boxes by destinations with precise location control.



3-2.
Box Labeling

Stepper motors control the rotation speed and direction of rollers during box labeling process.

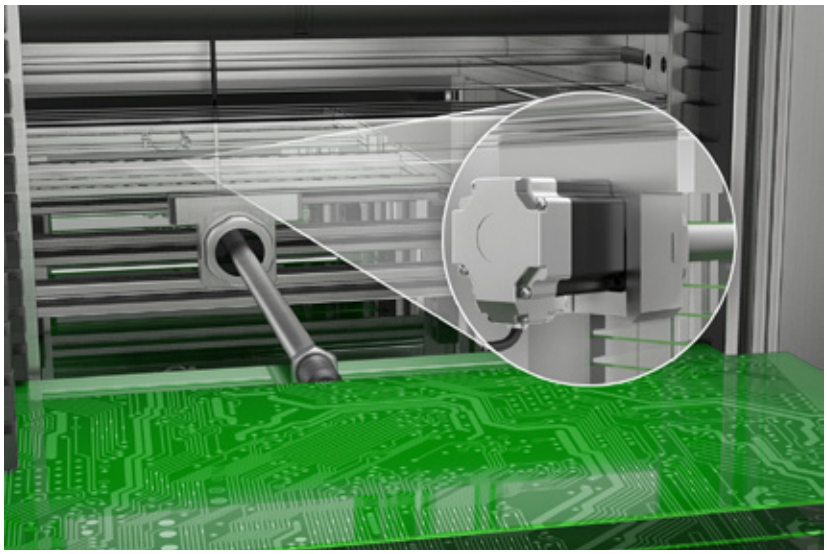
4. Plastics / Rubber Industry



4-1.
Turntable Assembly

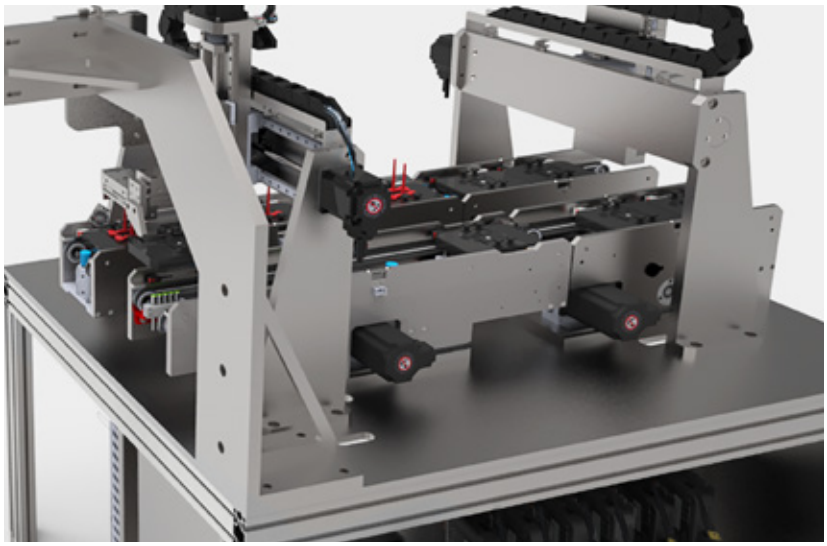
Integrated controller type closed loop stepper motor system controls the movement and position of the turntable in the production, transport, and assembly processes.

5. Machine Tools Industry



5-1.
PCB Loader

Closed loop stepper motor system is used to attach PCB boards to conveyors in SMT machinery.



5-2.
Assembly Machine

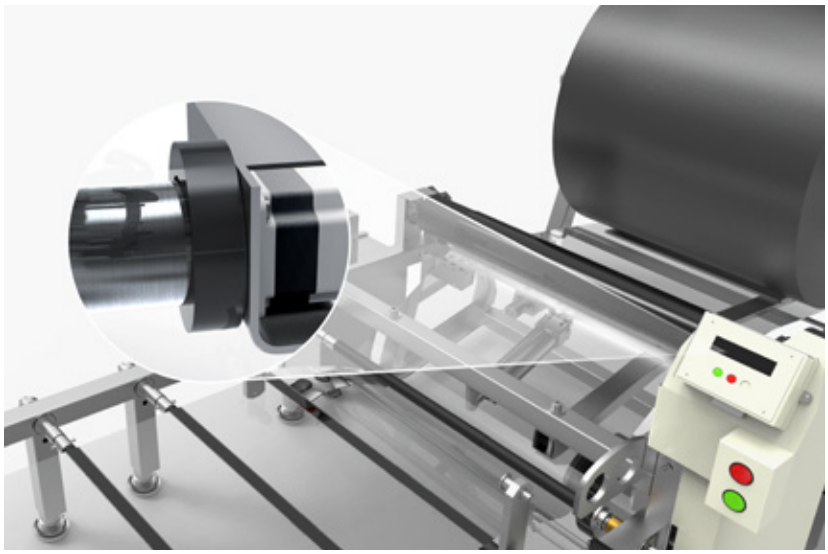
Closed loop stepper motor system (built-in brake type) controls the transfer of products in assembly machines.

6. Cultural Industry

6-1.
Water Fountain

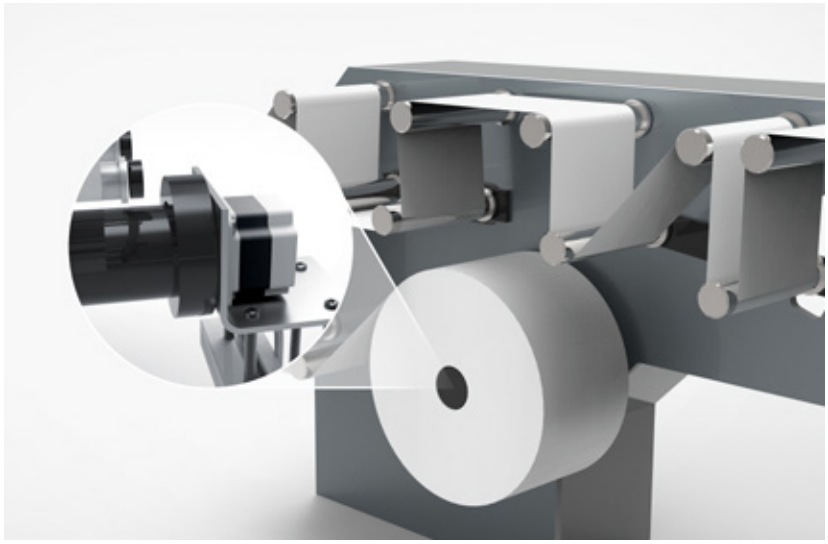
Closed loop stepper motor system controls the swing angle and speed of the fountain water nozzle.

7. Packaging Industry



7-1.
Fabric Rolling Machine

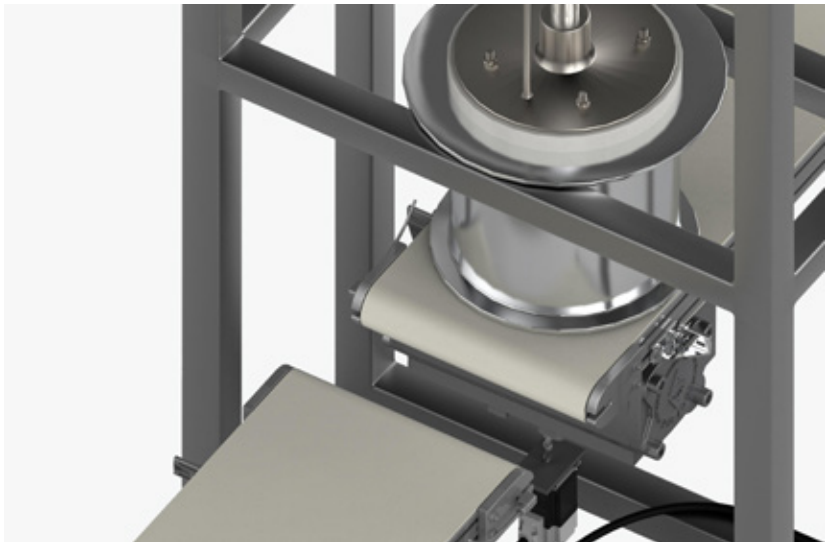
Stepper motors control rotation and direction of inspection board in fabric rolling machines.



7-2.
Auto Labeling Machine

Stepper motors control the movement of the axis of the rewinder machine in the automatic labeling machines.

8. Medical / Pharmaceutical Industry



8-1.
Medicine Molding Machine

Closed loop stepper motor system realizes accurate control without step-out through repeated operation to manufacture pill-type medicines.

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Products

Sensors, Controllers, Motion Devices, Safety, Measuring Equipment, Connection Equipment and more

• Photoelectric Sensors • Photomicro Sensors • Fiber Optic Sensors • Door Sensors • Area Sensors • Proximity Sensors • LiDAR
• Displacement Sensors • Ultrasonic Sensors • Rotary Encoders • Temperature Sensors • Temperature Transmitters • Pressure Sensors
• Pressure Transmitters • Smart Camera • Vision Sensors • Safety Light Curtains • Safety Door Switches • Safety Switches
• Safety Controllers • Temperature Controllers • Solid State Relays • Power Controllers • Counters • Timers • Digital Panel Meters
• Digital Display Units • Sensor Controllers • SMPS • Industrial PC • HMIs • Recorders • Indicators • Network Converters
• Closed Loop Stepper Motor System • 5-Phase Stepper Motor & Drivers • 2-Phase Stepper Motor Drivers • Motion Controllers
• Industrial Networking • I/O Terminal Blocks • Distribution Boxes • Cables • Control Switches / Pilot Lights / Buzzers • Software

202304-Motion Devices Brochure-EN-01

Series

Encoders rotativos incrementales
Tipo flecha

E15S/ E18S/ E20S/ E40S/E58S/ E68S

Serie E15S

Serie E18S

Serie E20S
(Tipo flecha)

Serie E40S
(Tipo flecha)

Serie E58S
(Onda sinusoidal,
tipo flecha)

Serie E68S
(Tipo flecha)

Especificaciones

· Diámetro de encoder: 15mm, 18mm, 20mm, 30mm, 40mm, 50mm, 58mm, 68mm
· Momento de inercia de flecha baja
· Varias resoluciones, códigos de salida, salidas de control y tipos de cables
· Salida: Salida totem pole, Salida NPN a colector abierto, salida de voltaje, salida line driver
· Pulso: 1 ~ 8,000 pulsos

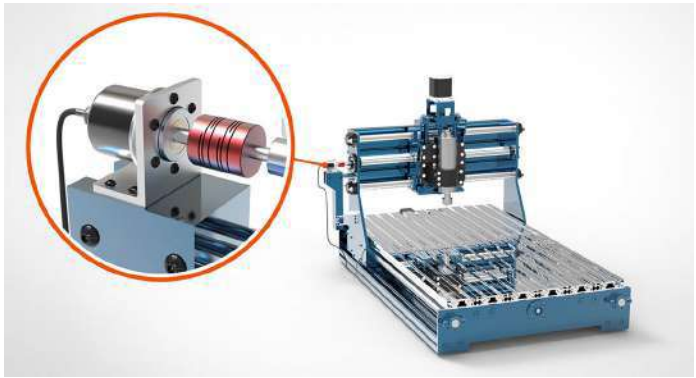
Ejemplo de aplicación

Serie E15S

Aplicación en cámaras PTZ que requieren un movimiento direccional y de zoom preciso.

Serie E68S

Los encoders y acopladores rotativos se usan para detectar y controlar la rotación de la flecha en fresadoras de tamaño compacto.



Series

Encoders rotativos incrementales
Tipo flecha hueca, flecha semi hueca integrada

E20HB/ E40HB/ E58H/ E60H/ E80H/ E100H

E20HB
(Tipo flecha semi-hueca)

E40HB
(Tipo flecha semi-hueca)

E58H
(Tipo flecha hueca)

E60H
(Tipo flecha hueca)

E80H
(Tipo flecha hueca)

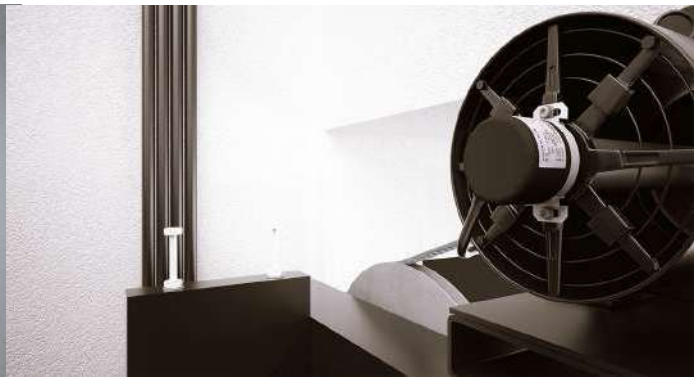
E100H
(Tipo flecha hueca)

Especificaciones

· Diámetro de encoder: 20mm, 40mm, 58mm, 60mm
· Varios tamaños de flecha hueca
· Varias resoluciones, códigos de salida, salidas de control y tipos de cables
· Salida: Salida totem pole, Salida NPN a colector abierto, salida de voltaje, salida line driver
· Pulso: 1~10,000 pulsos

Ejemplo de aplicación
Serie E40HB

Los encoders rotativos incrementales se instalan dentro del motor de la sala de control de funcionamiento de la puerta para controlar con precisión la posición de apertura / cierre de las puertas del ascensor mediante señales de impulsos de los encoders.



Serie ENC

Encoders rotativo incrementales con rueda

Características principales

· Encoders de tipo rueda ideales para medición de longitud o velocidad de objetos en movimiento continuo
· La forma de onda de salida de la distancia medida es proporcional a los pesos y medidas internacionales (m/pulg)
· Alimentación: 5 VCC ± 5%, 12-24 VCC ± 5%

ENC – 1 – 1 — N — 24 —

Serie	Fase de salida	Unidad mín. de medición	Salida de control	Alimentación	Cable
Tipo rueda	1: A, B	1: 1mm 4: 0.01yd 2: 1cm 5: 0.1yd 3: 1m 6: 1yd	T: Salida totem pole N: Salida NPN a colector abierto V: Salida de voltaje	5: 5VCC ±5% 24: 12-24VCC ±5%	Sin marca: Cable axial C: Cable saliente con conector

Especificaciones

Modelo			Encoder rotativo incremental tipo rueda
Especificación eléctrica	Fase de salida		Fase A, B
	Diferencia de fase de salida		Diferencia entre fase A y B : $\frac{T}{4} \pm \frac{T}{8}$ (T=1 ciclo de la fase A)
	Salida de control	Salida totem pole	• [Baja] - Corriente de carga: Máx. 30mA, voltaje residual: Máx. 0.4VCC • [Alta] - Corriente de carga: Máx. 10mA, Voltaje de salida (voltaje de alimentación de 5VCC): Mín. (voltaje de alimentación de -2.0)VCC, Voltaje de salida (voltaje de alimentación de12-24VCC): Min. (voltaje de alimentación de -3.0)VCC
		Salida NPN a colector abierto	Corriente de carga: Máx. 30mA, voltaje residual: Máx. 0.4VCC
		Salida de voltaje	Corriente de carga: Máx. 10mA, voltaje residual: Max. 0.4VCC
	Tiempo de respuesta (asc./desc.)	Salida totem pole	Máx. 1μs (longitud del cable: 2m, I de fuga = 20mA)
		Salida NPN a colector abierto	
		Salida de voltaje	

Series ENH/ ENHP

Encoder rotativo incremental con perilla

Serie ENH

Serie ENHP

Características principales

· Ideal para aplicaciones de entrada de pulso manual incluyendo maquinaria NC y fresadoras
· Interruptor de paro de emergencia, interruptor para habilitar operación
· Interruptor selector de eje de 6 posiciones, selector de velocidad de 4 posiciones
· Resolución de 100 pulsos por revolución
· Suministro de energía: 5 VCC ±5%, 12-24 VCC ±5%

Como especificarlo

Serie ENH

ENH – 100 – 1 – T – 24

Serie	Pulsos/revolución	Posición de fijación	Salida de control	Alimentación
Tipo manual	25, 100	1: Normal "H" 2: Normal "L"	T: Salida totem pole V: Salida de voltaje L: Salida line driver (※)	5: 5VCC ±5% 24: 12-24VCC ±5%

※La alimentación para Line driver es solo para 5VCC.

Serie ENHP

ENHP — 100 — 1 — L — 5

Serie	Pulsos/revolución	Posición de fijación	Salida de control	Alimentación
Encoder portátil con perilla	100	1: Normal "H" 2: Normal "L"	T: Salida totem pole L: Salida line driver	5: 5VCC ±5% 24: 12-24VCC ±5%

※La alimentación para Line driver es solo para 5VCC.

Series EP50S/ EP58S

Encoders rotativos absolutos una-vuelta de 50mm (Tipo flecha) CE

Características principales

· Caja de Ø50 mm, flecha sólida de Ø8 mm
· Varias opciones de código de salida: BCD, binario, código Gray
· Varias resoluciones: hasta 10 bits (1024 divisiones)
· Protección IP64 (estándar IEC)

EP50S

EP58S

Como especificarlo

EP50S	8	–	1024	–	1	R	–	P	–	24

Serie	Diám. de flecha	Pasos/revolución	Código de salida	Dirección de revolución	Salida de control	Alimentación
Tipo flecha sólido de Ø50mm	Ø8mm	Ver resolución	1: Código BCD 2: Código binario 3: Código Gray	F: El valor de salida incrementa en dirección CW R: El valor de salida incrementa en dirección CCW	P: Salida PNP a colector abierto N: Salida NPN a colector abierto	5 : 5VCC ±5% 24: 12-24VCC ±5%

EP58SC	10	–	1024	–	1	R	–	P	–	24

Serie Ø58mm	Diámetro de flecha			Pulsos/ revolución	Código de salida	Dirección de rotación	Salida de control	Alimentación
SC: Sujeción de flecha	Exter-na	10	Ø10mm	Referte a la resolución	1: Código BCD 2: Código binario 3: Código Gray	F: El valor de salida incrementa en dirección CW R: El valor de salida aumenta en sentido antihorario (CCW)	P: Salida PNP a colector abierto N: Salida NPN a colector abierto	5: 5VCC ±5% 24: 12-24VCC ±5%
SS: Sincronizador de flecha		6	Ø6mm					
HB: Flecha hueca ciega	Interna	8	Ø8mm					

Series MGA50S/MGAM50S

Encoder rotativo absoluto magnético de Ø50mm CE

Características principales

· Alta precisión en entornos hostiles, como golpes, vibraciones, polvo y humedad
· Código de salida: binario
· Opciones de interfaz de salida: Paralelo, SSI
· Resolución total de 23 bits (8,388,608): 10 bits de una sola vuelta (1024 divisiones) / Multivuelta de 13 bits (8192 rev.)
· Alimentación: 12-24 VCC ± 5%
· Función de alarma de desbordamiento (OVF)
· Protección IP50 (estándar IEC)

MGA50S
(Tipo flecha / una vuelta)

MGA50S
(Multi-vuelta)

Especificaciones

Serie MGA50S

Tipo	**Encoder rotativo absoluto magnético tipo flecha sólida de Ø50mm**		
Modelo	MGA50S8-□-□□-N-□		
Resolución	32, 40, 45, 48, 64, 90, 128, 180, 256, 360, 512, 720, 1024-divisiones		
Histéresis	±0.1°		
Error de posicionamiento ※1	±1-bit (LSB: Bit menos significativo)		
Código de salida	Código BCD	Código binario	Código Gray

※ 1: Cuando apague o encienda la unidad, puede haber un error de ±1bit (LSB) en la posición actual debido a la histéresis.

Serie MGAM50S

Tipo			**Encoder rotativo absoluto magnético multi-vuelta tipo flecha sólida de Ø50mm**	
Modelo			**MGAM50S8-1013-B-F-S-24**	**MGAM50S8-1013-B-F-PN-24**
Resolución		Una vuelta	1024-divisiones (10-bits)	
		Multi-vuelta	8192-revoluciones (13-bits)	
Límite de rotación cuando se apaga ※1			±90°	
Esp. eléctrica	Salida	Histéresis	±0.1°	
		Error de posicionamiento※2	±1-bit (LSB: Bit menos significativo)	
		Código de salida	24-bits, código binario 2	Código binario 2