Automation for a Changing World

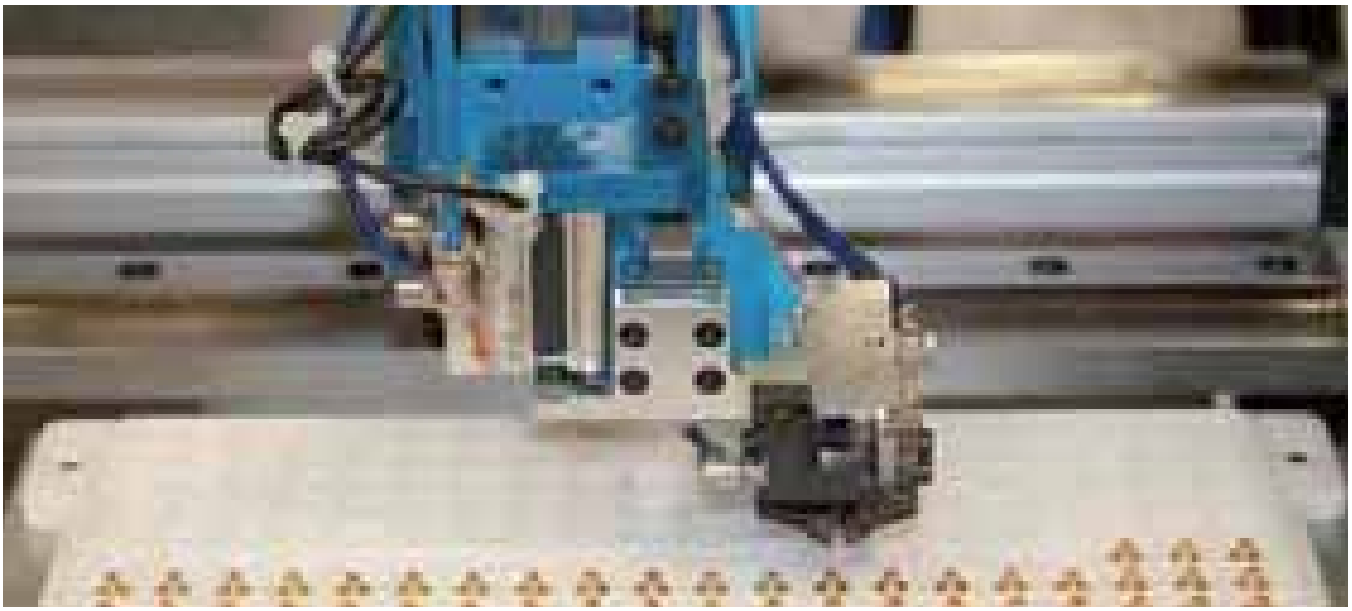
Delta AC Servo System
ASDA-M Series

www.deltaww.com

Smarter. Greener. Together.

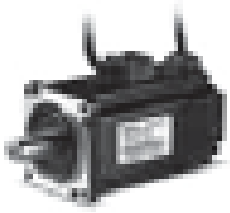
Servo Drive and Servo Motor Combinations

Servo Drives and Servo Motors	Examples
Servo Drives 750W Servo Drive ASD-M-0721- □ **Servo Motors** Options: 100W 200W 400W 750W / Options: 100W 200W 400W 750W / Options: 100W 200W 400W 750W **Output Capacity for One Servo Motor : 750W Max.**	750W Servo Drive: 750W, 750W, 750W 750W Servo Drive: 100W, 400W, 750W
Servo Drives 1.5kW Servo Drive ASD-M-1521- □ **Servo Motors** Options: 750W 1kW 1.5kW / Options: 750W 1kW 1.5kW / Options: 750W 1kW 1.5kW **Output Capacity for One Servo Motor: 1.5kW Max.**	1.5kW Servo Drive: 1.5kW, 1.5kW, 1.5kW 1.5kW Servo Drive: 750W, 1kW, 1.5kW



Product Line-up

Servo Drives		
	750W	1.5kW
	ASD-M-0721 - ☐	ASD-M-1521 - ☐

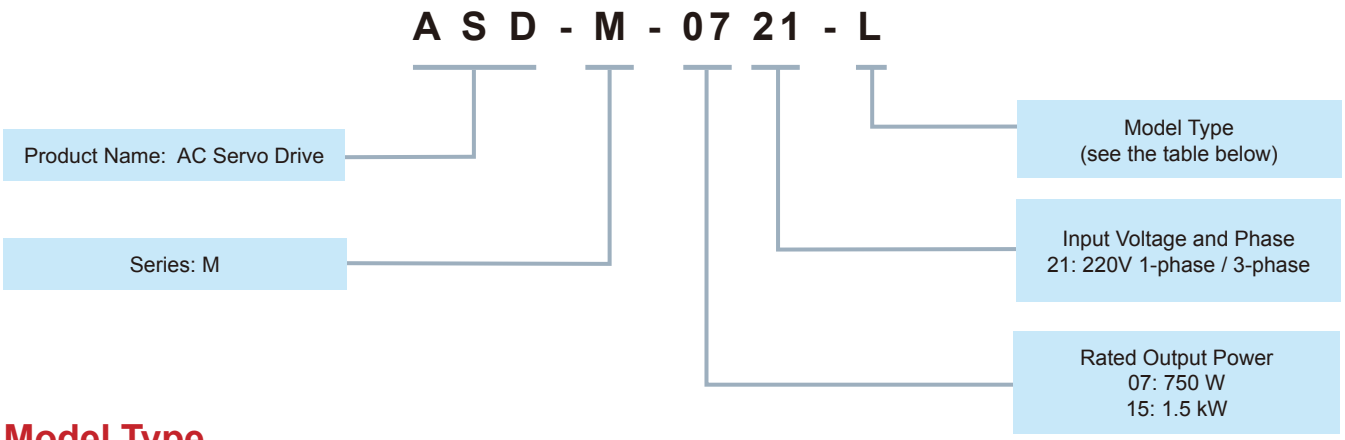
Servo Motors		
	ECMA-C 1040F ☐ S (S=8mm) ECMA-C △ 0401 ☐ S (S=8mm) ECMA-C △ 0602 ☐ S (S=14mm) ECMA-C △ 0604 ☐ S (S=14mm) ECMA-C △ 0604 ☐ H (H= High Inertia) ECMA-C △ 0804 ☐ 7 (7=14mm) ECMA-C △ 0807 ☐ S (S=19mm) ECMA-C △ 0807 ☐ H (H= High Inertia) ECMA-C △ 0907 ☐ S (S=16mm) ECMA-E △ 1305 ☐ S (S=22mm) ECMA-G △ 1303 ☐ S (S=22mm) ECMA-G △ 1306 ☐ S (S=22mm)	ECMA-C △ 0807 ☐ S (S=19mm) ECMA-C △ 0807 ☐ H (H= High Inertia) ECMA-C △ 0907 ☐ S (S=16mm) ECMA-C △ 0910 ☐ S (S=16mm) ECMA-C △ 1010 ☐ S (S=22mm) ECMA-E △ 1310 ☐ S (S=22mm) ECMA-F △ 1308 ☐ S (S=22mm) ECMA-F △ 1313 ☐ S (S=22mm) ECMA-E △ 1315 ☐ S (S=22mm) ECMA-G △ 1309 ☐ S (S=22mm)

Note:

1) The boxes (☐) at the ends of the servo drive model names are for optional configurations.
   For the actual model name, please refer to the model explanation of the servo drive.
2) The boxes (☐) in the model names of the servo motors represent shaft end/brake or the number of oil seal.
3) The triangles (△) in the model names of the servo motors represent encoder type. △ =1: Incremental encoder, 20-bit ; △ =2: Absolute encoder, 17-bit.

Model Name Explanation

ASDA Series Servo Drives

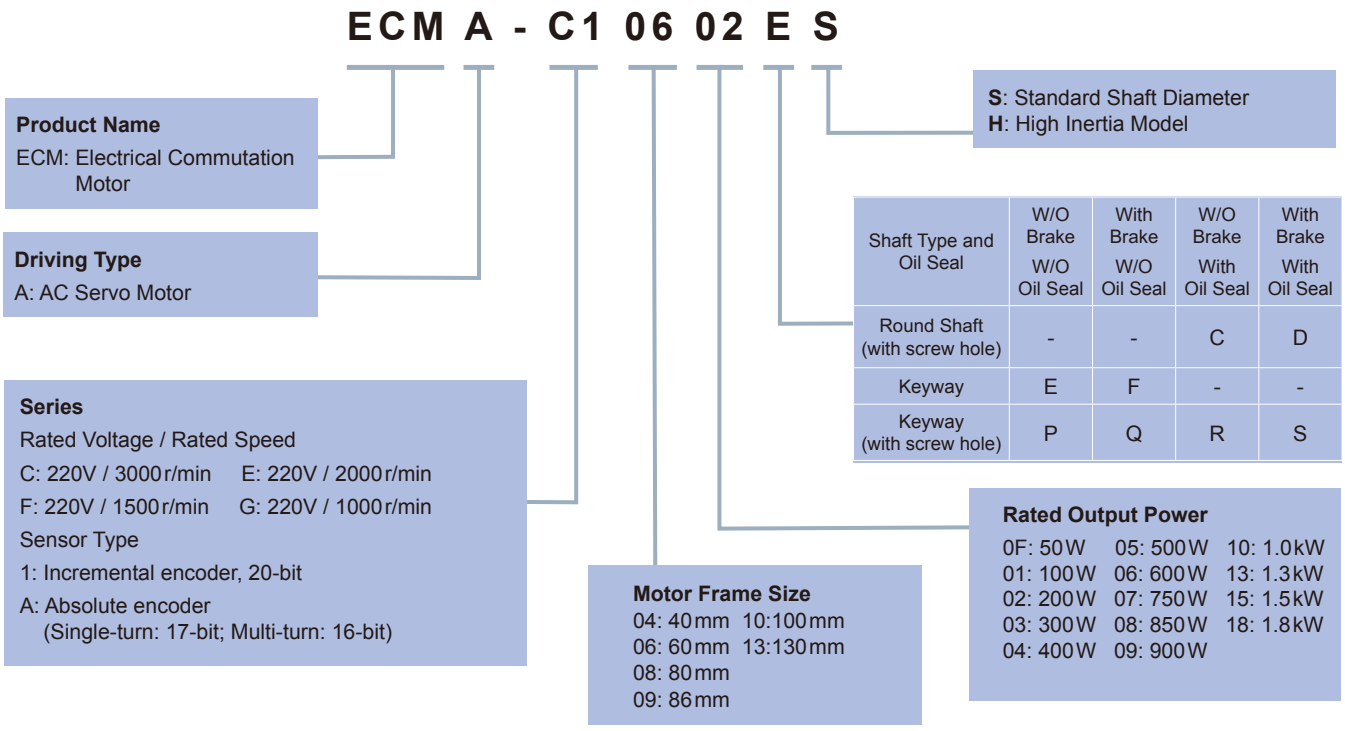


Model Type

Type	Full-Closed Control	CANopen	DMCNET	E-Cam
M	○	○	X	○
F	○	X	○	○
L	○	X	X	X

M: Supports CANopen F: Supports DMCNET L: Pure Servo

ECMA Series Servo Motors



Shaft Type and Oil Seal	W/O Brake W/O Oil Seal	With Brake W/O Oil Seal	W/O Brake With Oil Seal	With Brake With Oil Seal
Round Shaft (with screw hole)	-	-	C	D
Keyway	E	F	-	-
Keyway (with screw hole)	P	Q	R	S

Servo Drive Specifications

220V Series

ASDA-M Series			750W	1.5kW
			07	15
Power Supply	Phase / Voltage		Three-Phase or Single-Phase 220 V_{AC}	
	Permissible Voltage Range		Three-Phase or Single-Phase 200~230 V_{AC}, -15% ~ 10%	
	Input Current (3PH) (Units: Arms)		9.3	18.6
	Input Current (1PH) (Units: Arms)		17.8	33.3
	Continuous output current		5.1	8.3
Cooling System			Fan Cooling	
Encoder Resolution / Feedback Resolution			20-bit (1280000 p/rev)	
Control of Main Circuit			SVPWM (Space Vector Pulse Width Modulation) Control	
Tuning Modes			Auto / Manual	
Regenerative Resistor			None	
Position Control Mode	Max. Input Pulse Frequency		Max. 500 Kpps / 4 Mpps (Line driver) Max. 200 Kpps (Open collector)	
	Pulse Type		Pulse + Direction, A phase + B phase, CCW pulse + CW pulse	
	Command Source		External pulse train (Pt mode) / Internal procedures (Pr mode)	
	Smoothing Strategy		Low-pass and P-curve filter	
	Electronic Gear		Electronic gear N/M multiple N: 1~32767, M: 1:32767 (1/50<N/M<25600)	
	Torque Limit Operation		Set by parameters	
	Feed Forward Compensation		Set by parameters	
Speed Control Mode	Analog Input Command	Voltage Range	0 ~ ±10 V_{DC}	
		Input Resistance	10 KΩ	
		Time Constant	2.2 μs	
	Speed Control Range *1		1 : 5000	
	Command Source		External analog signal / Internal parameters	
	Smoothing Strategy		Low-pass and S-curve filter	
	Torque Limit Operation		Set by parameters or via analog input	
	Frequency Response Characteristic		Maximum 1 kHz	
	Speed Accuracy *2 (at rated rotation speed)		0.01% or less at 0 to 100% load fluctuation	
			0.01% or less at ±10% power fluctuation	
			0.01% or less at 0 °C to 50 °C ambient temperature fluctuation	
Torque Control Mode	Analog Input Command	Voltage Range	0 ~ ±10 V_{DC}	
		Input Resistance	10 KΩ	
		Time Constant	2.2 μs	
	Command Source		External analog signal / Internal parameters	
	Smoothing Strategy		Low-pass filter	
	Speed Limit Operation		Set by parameters or via analog input	
Analog Monitor Output			Monitor signal can be set by parameters (Output voltage range: ±8 V)	
Digital Inputs/Outputs	Inputs		Servo On, Reset, Gain switching, Pulse clear, Zero speed CLAMP, Command input reverse control, Command triggered, Speed/ Torque limit enabled, Position command selection, Motor stop, Speed Position Selection, Position / Speed mode switching, Speed / Torque mode switching, Torque / Position mode switching, Pt / Pr command switching, Emergency stop, Forward / Reverse inhibit limit, Reference "Home" sensor, Forward / Reverse operation torque limit, Move to "Home", Electronic cam, Forward / Reverse JOG input, Event trigger Pr command, Electronic gear ratio (Numerator) selection and Pulse inhibit input	
	Outputs		Encoder signal output (A, B, Z Line Driver and Z Open Collector)	
			Servo ready, Servo On, At Zero speed, At Speed reached, At Positioning completed, At Torques limit, Servo alarm (Servo fault) activated, Electromagnetic brake control, Homing completed, Output overload warning, Servo warning activated, Position command overflow, Forward / Reverse software limit, Internal position command completed, Capture operation completed output, Motion control completed output, Master position of E-CAM (electronic CAM)	
Protective Functions			Overcurrent, Overvoltage, Undervoltage, Motor overheated, Regeneration error, Overload, Overspeed, Abnormal pulse control command, Excessive deviation, Encoder error, Adjustment error, Emergency stop activated, Reverse/ Forward limit switch error, Position excessive deviation of full-close control loop, Serial communication error, Input power phase loss, Serial communication time out, short circuit protection of U, V, W, and CN1, CN2, CN3 terminals	
Communication Interface			RS-232 / RS-485 / CANopen / USB	
Environment	Installation Site		Indoor location (free from direct sunlight), no corrosive liquid and gas (far away from oil mist,flammable gas, dust)	
	Altitude		Altitude 1000m or lower above sea level	
	Atmospheric pressure		86 kPa ~ 106 kPa	
	Operating Temperature		0 °C ~ 55 °C(If operating temperature is above 45°C, forced cooling will be required)	
	Storage Temperature		-20 °C ~ 65 °C	
	Humidity		0 ~ 90% RH (non-condensing)	
	Vibration		20 Hz or below 9.80665 m/s^2 (1G) · 20 ~ 50Hz 5.88 m/s^2 (0.6G)	
	IP Rating		IP20	
	Power System		TN System*3	
	Certifications		IEC/EN 61800-5-1 · UL 508C CE c UL us LISTED	

Footnote:

*1. Rated rotation speed: With a full load, speed ratio is defined as the minimum speed (the motor will not pause).

*2. When command is rated rotation speed, the speed fluctuation rate is defined as: (Empty load rotation speed - Full load rotation speed) / Rated rotation speed

*3. TN system: A power distribution system having one point directly earthed, the exposed conductive parts of the installation being connected to that point by a protective earth conductor.

Servo Motor Specifications

Low Inertia Series

ECMA Series	C104	C △ 04	C △ 06		C △ 08		C △ 09		C △ 10
	0F	01	02	04 □ S	04	07	07	10	10
Rated output power (kW)	0.05	0.1	0.2	0.4	0.4	0.75	0.75	1.0	1.0
Rated torque (N-m)*1	0.159	0.32	0.64	1.27	1.27	2.39	2.39	3.18	3.18
Maximum torque (N-m)	0.477	0.96	1.92	3.82	3.82	7.16	7.14	8.78	9.54
Rated speed (r/min)	3000						3000		3000
Maximum speed (r/min)	5000						3000		5000
Rated current (A)	0.69	0.90	1.55	2.6	2.6	5.1	3.66	4.25	7.3
Maximum current (A)	2.05	2.70	4.65	7.8	7.8	15.3	11	12.37	21.9
Power rating (kW/s)	12.27	27.7	22.4	57.6	24.0	50.4	29.6	38.6	38.1
Rotor moment of inertia (x10-4kg-m^2)	0.0206	0.037	0.177	0.277	0.68	1.13	1.93	2.62	2.65
Mechanical time constant (ms)	1.14	0.75	0.80	0.53	0.74	0.63	1.72	1.20	0.74
Torque constant-KT (N-m/A)	0.23	0.36	0.41	0.49	0.49	0.47	0.65	0.75	0.44
Voltage constant-KE(mV/(r/min)	9.8	13.6	16	17.4	18.5	17.2	24.2	27.5	16.8
Armature resistance (Ohm)	12.7	9.30	2.79	1.55	0.93	0.42	1.34	0.897	0.20
Armature inductance (mH)	26	24.0	12.07	6.71	7.39	3.53	7.55	5.7	1.81
Electrical time constant (ms)	2.05	2.58	4.3	4.3	7.96	8.36	5.66	6.35	9.3
Insulation class	Class A (UL), Class B (CE)								
Insulation resistance	100MΩ · DC 500V								
Insulation strength	1.8k V_{AC},1 sec								
Weight (kg) (without brake)	0.42	0.5	1.2	1.6	2.1	3.0	2.9	3.8	4.3
Weight (kg) (with brake)	--	0.8	1.5	2.0	2.9	3.8	3.69	5.5	4.7
Max. radial shaft load (N)	78.4	78.4	196	196	245	245	245	245	490
Max. thrust shaft load (N)	39.2	39.2	68	68	98	98	98	98	98
Power rating (kW/s) (with brake)	--	25.6	21.3	53.8	22.1	48.4	29.3	37.9	30.4
Rotor moment of inertia (Kg.m^2) (with brake)	--	0.04	0.19	0.30	0.73	1.18	1.95	2.67	3.33
Mechanical time constant (ms) (with brake)	--	0.81	0.85	0.57	0.78	0.65	1.74	1.22	0.93
Brake holding torque [Nt-m (min)]	--	0.3	1.3	1.3	2.5	2.5	2.5	2.5	8
Brake power consumption (at 20°C) [W]	--	7.3	6.5	6.5	8.2	8.2	8.2	8.2	18.7
Brake release time [ms (Max)]	--	5	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	--	25	70	70	70	70	70	70	70
Vibration grade (μm)	15								
Operating temperature (°C)	0°C to 40°C								
Storage temperature (°C)	-10°C to 80°C								
Operating humidity	20 to 90%RH (non-condensing)								
Storage humidity	20 to 90%RH (non-condensing)								
Vibration capacity	2.5G								
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is fitted to the rotating shaft (an oil seal model is used)								
Certifications	IEC/EN 61800-5-1 · UL 508C CE c UL us LISTED								

Footnote:

*1. Rate torque values are continuous permissible values at 0~ 40°C ambient temperature when attaching with the sizes of heatsinks listed below:
ECMA-_ _ 04 / 06 / 08 : 250mm x 250mm x 6mm
ECMA-_ _ 10 : 300mm x 300mm x 12mm
ECMA-_ _ 13 : 400mm x 400mm x 20mm
Material type : Aluminum F40, F60, F80, F100, F130

*2. The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.

Medium / Medium-High / High Inertia Series - 220V Series

ECMA Series	E △ 13			G △ 13			F △ 13	C △ 06	C △ 08
	05	10	15	03	06	09	08	04 □ H	07 □ H
Rated output power (kW)	0.5	1.0	1.5	0.3	0.6	0.9	0.85	0.4	0.75
Rated torque (N-m)*1	2.39	4.77	7.16	2.86	5.73	8.59	5.41	1.27	2.39
Maximum torque (N-m)	7.16	14.3	21.48	8.59	17.19	21.48	13.8	3.82	7.16
Rated speed (r/min)	2000			1000			1500	3000	3000
Maximum speed (r/min)	3000			2000			3000	5000	5000
Rated current (A)	2.9	5.6	8.3	2.5	4.8	7.5	7.1	2.6	5.1
Maximum current (A)	8.7	16.8	24.9	7.5	14.4	22.5	19.4	7.8	15.3
Power rating (kW/s)	7.0	27.1	45.9	10.0	39.0	66.0	21.52	21.7	19.63
Rotor moment of inertia (x10-4kg-m^2)	8.17	8.41	11.18	8.17	8.41	11.18	13.6	0.743	2.91
Mechanical time constant (ms)	1.91	1.51	1.10	1.84	1.40	1.06	2.43	1.42	1.6
Torque constant-KT (N-m/A)	0.83	0.85	0.87	1.15	1.19	1.15	0.76	0.49	0.47
Voltage constant-KE(mV/(r/min)	30.9	31.9	31.8	42.5	43.8	41.6	29.2	17.4	17.2
Armature resistance (Ohm)	0.57	0.47	0.26	1.06	0.82	0.43	0.38	1.55	0.42
Armature inductance (mH)	7.39	5.99	4.01	14.29	11.12	6.97	4.77	6.71	3.53
Electrical time constant (ms)	12.96	12.88	15.31	13.55	13.50	16.06	12.55	4.3	8.36
Insulation class	Class A (UL), Class B (CE)								
Insulation resistance	100MΩ · DC 500V								
Insulation strength	1.8k V_{AC},1 sec								
Weight (kg) (without brake)	6.8	7.0	7.5	6.8	7.0	7.5	8.6	1.8	3.4
Weight (kg) (with brake)	8.2	8.4	8.9	8.2	8.4	8.9	10.0	2.2	3.9
Max. radial shaft load (N)	490	490	490	490	490	490	490	196	245
Max. thrust shaft load (N)	98	98	98	98	98	98	98	68	98
Power rating (kW/s) (with brake)	6.4	24.9	43.1	9.2	35.9	62.1	19.78	21.48	19.3
Rotor moment of inertia (Kg.m^2) (with brake)	8.94	9.14	11.90	8.94	9.14	11.9	14.8	0.751	2.96
Mechanical time constant (ms) (with brake)	2.07	1.64	1.19	2.0	1.51	1.13	2.65	1.43	1.62
Brake holding torque [Nt-m (min)]	10.0	10.0	10.0	10.0	10.0	10.0	10.0	1.3	1.3
Brake power consumption (at 20°C) [W]	19.0	19.0	19.0	19.0	19.0	19.0	19.0	6.5	6.5
Brake release time [ms (Max)]	10	10	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70	70	70	70	70
Vibration grade (μm)	15								
Operating temperature (°C)	0°C to 40°C (32°F to 104°F)								
Storage temperature (°C)	-10°C to 80°C (-14°F to 176°F)								
Operating humidity	20 to 90%RH (non-condensing)								
Storage humidity	20 to 90%RH (non-condensing)								
Vibration capacity	2.5G								
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is fitted to the rotating shaft (an oil seal model is used)								
Certifications	IEC/EN 61800-5-1 · UL 508C CE c UL us LISTED								

Footnote:

*1. Rated torque values are continuous permissible values at 0 ~ 40°C ambient temperature when attaching with the sizes of heatsinks listed below:
ECMA-_ _ 04 / 06 / 08 : 250mm x 250mm x 6mm
ECMA-_ _ 10 : 300mm x 300mm x 12mm
ECMA-_ _ 13 : 400mm x 400mm x 20mm
Material type : Aluminum F40, F60, F80, F100, F130

*2. The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.

*3. To reach the motor's max. torque limit of 250%, use the servo drive with higher watts.

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ASDA-A+_C_EN_20101202

DELTA ELECTRONICS, INC.

ASDA-A+

DELTA ASDA-A+ AC Servo System

www.delta.com.tw/industrialautomation

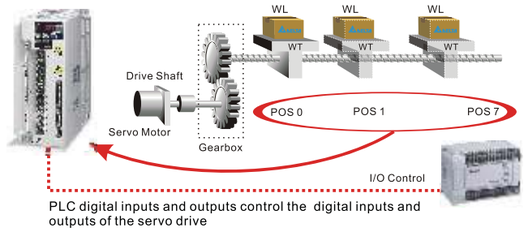
AC Servo System

Features

Functional Characteristics

New-generation, high horsepower ASDA-A+ series not only follows the features of the existing Delta servo products, but also provides the functions which are particularly for industries requiring high torque output and high resolution.

- ♦ Built-in Position/Speed/Torque modes.
- ♦ Easy internal single-axis position control.
- ♦ Feed step control mode (control of cutting). 27 positions can be easily controlled and implemented through the parameter settings and by working with digital inputs/outputs and Modbus communication protocol.
- ♦ Support Modbus communication (RS-485/RS-422/RS-232)
- ♦ Provide high-speed line receiver pulse input (Max. 4MHz)
- ♦ Enhance encoder resolution to 20bit (1280000 p/rev)



PLC digital inputs and outputs control the digital inputs and outputs of the servo drive

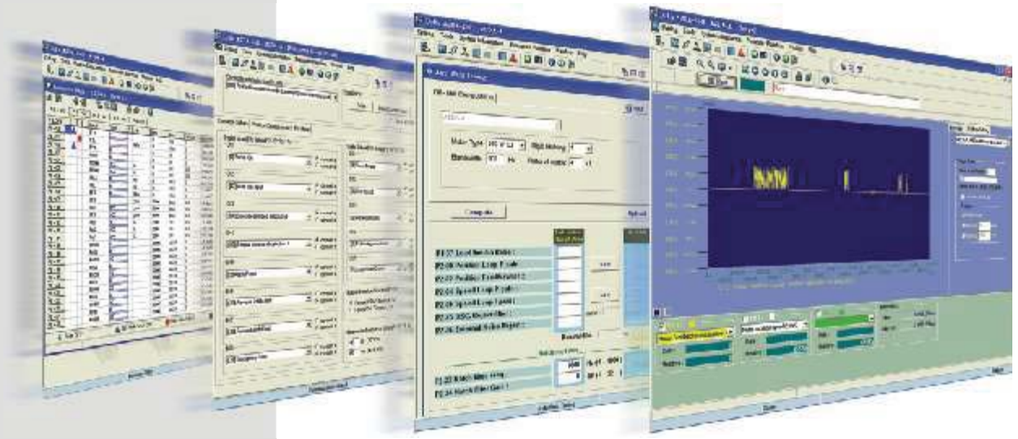
Excellent Performance

- ♦ Motor settling time below 1msec
- ♦ Speed responsiveness characteristic: 550Hz
- ♦ Great stability and performance at low speed: less than 0.5% error at 1rpm per rotation

ASDA-Soft Servo Software

New version of ASDA-A-Soft servo software has a better interface and is built-in with more functions, greatly enhancing the handiness of the software and considerably shortening the time for the users to get used to ASDA-Soft.

Select Servo Drive → **Read/Write Parameters** → **Choose Control Mode** → **Adjust Gains and Offsets** → **Monitor Operation** → **Complete Tuning**



Servo Drive ASDA-A+ Series

ASD - A 45 23 - B

- Product Name: ASD: AC Servo Drive
- Series: A: A series
- Rated Output Power: 45: 4.5kW; 55: 5.5kW; 75: 7.5kW
- Input Voltage and Phase: 23: 220V Phase
- Encoder Resolution: B: 20bit

Servo Motor ECMA Series

ECM A - F2 18 45 P S

- Product Name: ECM: Electrical Commutation Motor
- Driving Type: A: AC Servo Motor
- Series: Rated Voltage / Rated Speed: F: 220V / 1500rpm; Sensor Type: 2: 20bit
- Motor Frame Size: 18: 180mm
- Rated Output Power: 30: 3kW; 55: 5.5kW; 45: 4.5kW; 75: 7.5kW
- Standard Shaft Dimensions: S(35mm)*1; Specified Shaft Dimensions: 2=22mm, 3=42mm

Shaft Type and Oil Seal	No Brake No Oil Seal	With Brake No Oil Seal	No Brake With Oil Seal	With Brake With Oil Seal
Round Shaft (with screw hole)	A	B	C	D
Keyway (with screw hole)	P	Q	R	S

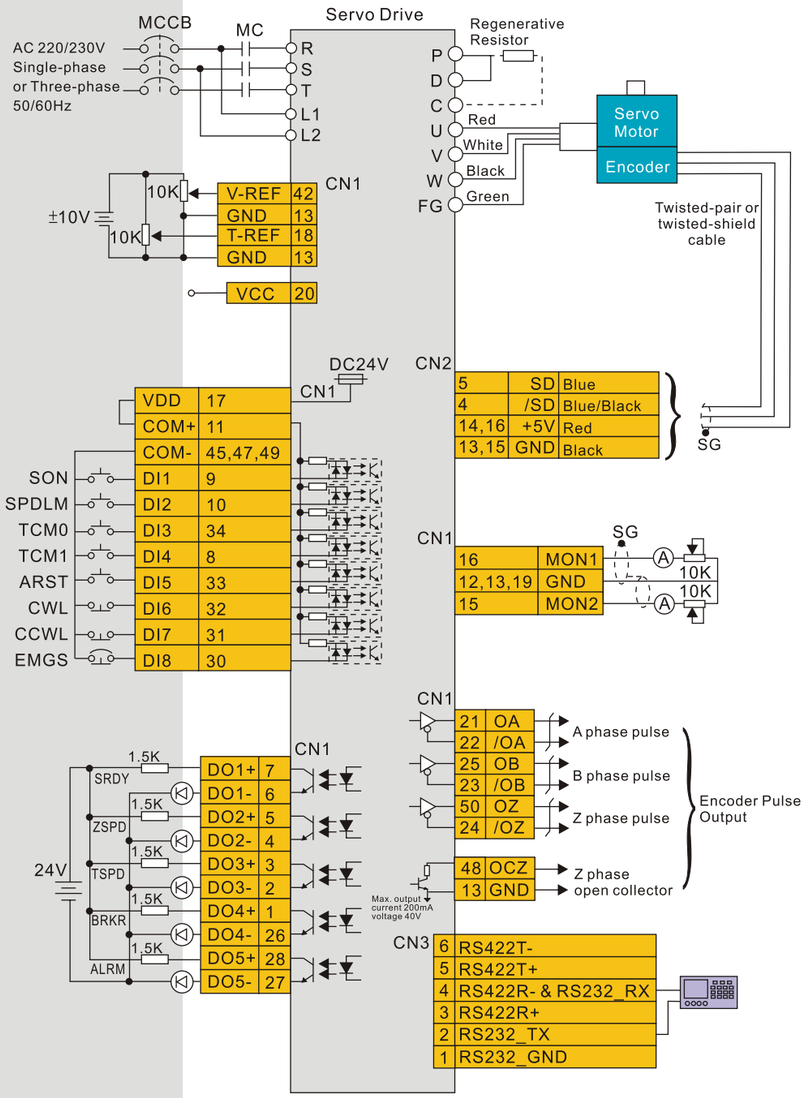
Servo Drive		Connectable Servo Motor
Power	Model Name	
4.5kW	ASD-A4523-B	ECMA-F21830☐S(3kW)*2 ECMA-F21845☐S(4.5kW)
5.5kW	ASD-A5523-B	ECMA-F21855☐3(5.5kW)
7.5kW	ASD-A7523-B	ECMA-F21875☐3(7.5kW)

*1. For the detailed dimensions explanation, please refer to "Medium and High Inertia Servo Motor Dimensions (ECMA Series)" on page 15.
*2. The boxes(☐) in the model names are for optional configurations (brake, shaft type and oil seal).

Standard Connections and Specifications

ASDA-A+

Torque (T) Control Mode



Servo Drive Specifications (ASDA-A+ Series)

ASDA-A□□-B Series			4.5kW	5.5kW	7.5kW
			45	55	75
Power supply	Phase / Voltage		Three-phase 220VAC		
	Permissible Voltage Range		Three-phase 200~230VAC, -15%~10%		
	Permissible Frequency Range		50 / 60Hz ±5%		
Cooling System			Fan Cooling		
Encoder Resolution /Feedback Resolution			20bit (1280000 p/rev)		
Control of Main Circuit			SVPWM (Space Vector Pulse Width Modulation) Control		
Tuning Modes			Auto / Manual		
Dynamic Brake			Built-in		
Position Control Mode	Max. Input Pulse Frequency		High-speed pulse input: 4MppsMax.500Kpps(Line receiver) / Max. 200Kpps (Open collector)		
	Pulse Type		Pulse + Direction, A phase + B phase, CCW pulse + CW pulse		
	Command Source		External pulse train / Internal parameters		
	Smoothing Strategy		Low-pass and P-curve filter		
	Electronic Gear		Electronic gear N/M multiple N: 1~32767, M: 1:32767(1/50<N/M<200)		
	Torque Limit Operation		Set by parameters		
	Feed Forward Compensation		Set by parameters		
Speed Control Mode	Analog Input Command	Voltage Range	0 ~ ±10 V DC		
		Input Resistance	10K		
		Time Constant	2.2 s		
	Speed Control Range*1		1:3000		
	Command Source		External analog signal / Internal parameters		
	Smoothing Strategy		Low-pass and S-curve filter		
	Torque Limit Operation		Set by parameters or via Analog input		
	Frequency Response Characteristic		Maximum 550Hz		
	Speed Accuracy *2 (at rated rotation speed)		0.01% or less at 0 to 100% load fluctuation		
			0.01% or less at ±10% power fluctuation		
			0.01% or less at 0°C to 50°C ambient temperature fluctuation		
Torque Control Mode	Analog Input Command	Voltage Range	0~±10 V DC		
		Input Resistance	10K Ω		
		Time Constant	2.2 μs		
	Command Source		External analog signal / Internal parameters		
	Smoothing Strategy		Low-pass filter		
	Speed Limit Operation		Parameter Setting or via Analog input		
Analog Monitor Output			Monitor signal can set by parameters (Output voltage range: ±8V)		
Digital Input/Output		Input	Servo On, Reset, Gain switching, Pulse clear, Zero speed CLAMP, Speed/Torque limit enabled, Emergency stop, Forward / Reverse inhibit limit, Position / Speed mode switching, Speed / Torque mode switching, Torque / Position mode switching, Feed step selection input, Feed step mode input, Auto run input, Electronic gear ratio (Numerator) selection		
		Output	Encoder signal output (A, B, Z Line Driver / Z Open collector)		
			Servo ready, Servo On, At Zero speed, At Speed reached, At Positioning completed, At Torques limit, Servo alarm (Servo fault) activated, Electromagnetic brake control, Homing completed, Output overload warningServo warning activated, Internal position command completed		
Protective Functions			Overcurrent, Overvoltage, Undervoltage, Motor overheated, Regeneration error, Overload, Overspeed, Abnormal pulse control command, Excessive deviation, Watch dog execution time out, Encoder error, Adjustment error, Emergency stop activated, Reverse/ Forward limit switch error, Memory error, DSP communication error, Serial communication error, Input power phase loss, Serial communication time out, Command write-in error, short circuit protection of U, V, W, and Cn1, CN2, CN3 terminals		
Communication Interface			RS-232 / RS-485 / RS-422		
Environment	Installation Site		Indoor location (free from direct sunlight), no corrosive liquid and gas (far away from oil mist, flammable gas, dust)		
	Altitude		Altitude 1000m or lower above sea level		
	Atmospheric pressure		86kPa to 106kPa		
	Operating Temperature		0°C to 55°C (If operating temperature is above specified range, forced cooling will be required)		
	Storage Temperature		-20°C to 65°C (-4°C to 149°F)		
	Humidity		0 to 90% (non-condensing)		
	Vibration		9.80665m/s^2 (1G) less than 20Hz, 5.88m/ s^2 (0.6G) 20 to 50Hz		
	IP Rating		IP20		
	Power System		TN System*3		
	Approvals		IEC / EN 61800-5-1		

CE Mark Safety Approved · UL/cUL Safety Approved · C-TICK Mark Safety Approved

*1. Rated rotation speed: When full load, speed ratio is defined as the minimum speed (the motor will not pause).
*2. When command is rated rotation speed, the speed fluctuation rate is defined as: (Empty load rotation speed Full load rotation speed) / Rated rotation speed
*3. TN system: A power distribution system having one point directly earthed, the exposed conductive parts of the installation being connected to that points by protective earth conductor.

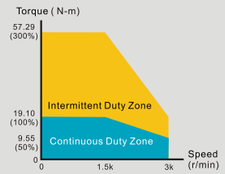
AC Servo System

ASDA-A+

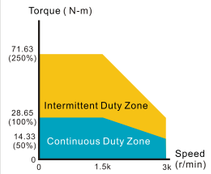
Medium and High Inertia Servo Motor Specifications (ECMA Series)

Model: ECMA Series	F218			
	30	45	55	75
Rated output power (kW)	3.0	4.5	5.5	7.5
Rated torque (N-m)	19.10	28.65	35.01	47.74
Maximum torque (N-m)	57.29	71.62	87.53	119.36
Rated speed (r/min)	1500			
Maximum speed (r/min)	3000			
Rated current (A)	19.4	32.5	40.0	47.5
Maximum current (A)	58.2	81.3	100.0	118.8
Power rating (kW/s)	66.4	105.5	122.9	159.7
Rotor moment of inertia (kg.m^2)	54.95E-4	77.75E-4	99.78 E-4	142.7 E-4
Mechanical time constant (ms)	1.28	0.92	0.96	0.63
Torque constant-KT (N-m/A)	0.98	0.88	0.88	1.01
Voltage constant-KE(mV/(r/min))	35.0	32.0	31.0	35.5
Armature resistance (Ohm)	0.077	0.032	0.025	0.015
Armature inductance (mH)	1.27	0.89	0.60	0.40
Electrical time constant (ms)	16.5	27.8	24.0	26.7
Insulation class	Class B（CE）			
Insulation resistance	100MΩ , DC 500V以上			
Insulation strength	AC 1500 V, 50 Hz, 60 seconds			
Weight (kg) (without brake)	18.5	23.5	30.5	37.0
Weight (kg) (with brake)	22.5	29	36	43
Max. radial shaft load (N)	1470	1470	1764	1764
Max. thrust shaft load (N)	490	490	588	588
Power rating(kW/s) (with brake)	63.9	101.8	119.4	156.6
Rotor moment of inertia(kg.m^2)(with brake)	57.06E-4	80.65E-4	102.70E-4	145.55E-4
Mechanical time constant(ms)(with brake)	1.33	0.96	0.99	0.64
Brake holding torque[Nt-m(min)]	25			
Brake power constumption (at 20°C) [W]	20.4			
Brake release time [ms (Max)]	10			
Brake pull-ine time [ms (Max)]	70			
Vibration grade (μm)	15			
Operating temperature (°C)	0~40			
Storage temperature(°C)	-10~80			
Operating humidity	20~90%RH (non-condensing)			
Storage humidity	20~90%RH (non-condensing)			
Vibration capacity	2.5G			
IP rating	(IP65 (when both waterproof connectors and shaft seal installation (or selecting oil seal models, an oil seal is used to be fitted to the rotating shaft, making the connectors waterproof (IP65 applicable)) are used.)			
Approvals	IEC60034-1 CE Mark Safety Approved cULus			

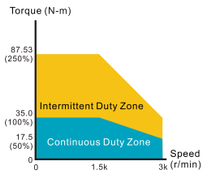
Medium and High Inertial Servo Motor Speed-Torque Curves



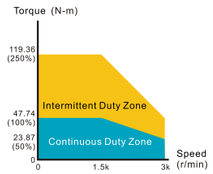
ECMA-F21830□□



ECMA-F21845□□



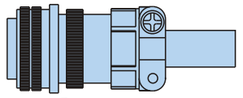
ECMA-F21855□□



ECMA-F21875□□

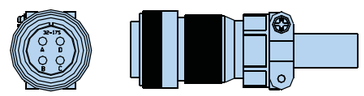
Power Connector

ASD-CAPW2000
(for models of 4.5kW and below)
CLAMP : MS3057-16A



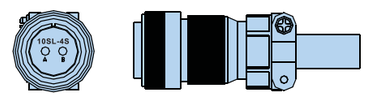
Straight Plug MS 3106A-24-11S

ASD-CAPW4000
(for models of 5.5kW and above)
CLAMP : WPS3057-20A



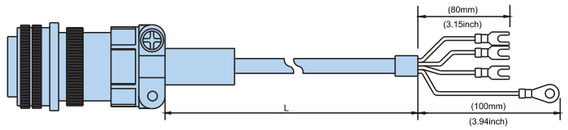
Straight Plug WPS3106A-32-17S

ASD-CNBR1000
(for models of 5.5kW and above)
CLAMP : WPS3106A-4S-R



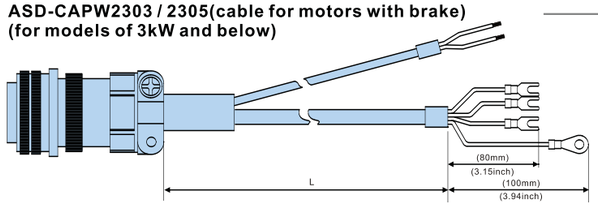
Power Cable

ASD-CAPW2203 / 2205(for 3kW servo motor)



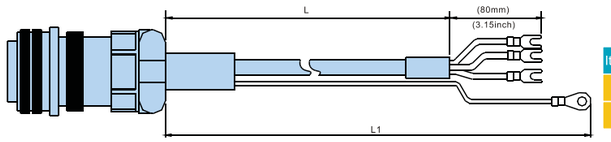
Item	Part No.	Straight	L	
			mm	inc
1	ASD-CAPW2203	MS 3106A-24-11S	3000 ± 100	118 ± 4
2	ASD-CAPW2205	MS 3106A-24-11S	5000 ± 100	197 ± 4

ASD-CAPW2303 / 2305(cable for motors with brake)
(for models of 3kW and below)



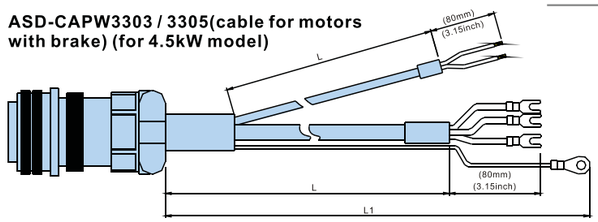
Item	Part No.	Straight	L	
			mm	inc
1	ASD-CAPW2303	MS 3106A-24-11S	3000 ± 100	118 ± 4
2	ASD-CAPW2305	MS 3106A-24-11S	5000 ± 100	197 ± 4

ASD-CAPW3203/3205(for 4.5kW model)



Item	Part No.	Straight	L	
			mm	inc
1	ASD-CAPW3203	MS 3106-24-11S	3000 ± 100	118 ± 4
2	ASD-CAPW3205	MS 3106-24-11S	5000 ± 100	197 ± 4

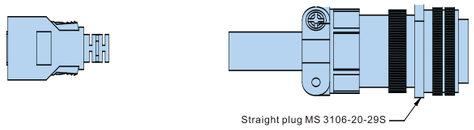
ASD-CAPW3303 / 3305(cable for motors with brake) (for 4.5kW model)



Item	Part No.	Straight	L		L1	
			mm	inc	mm	inc
1	ASD-CAPW3303	MS 3106A-24-11S	3000 ± 100	118 ± 0.4	3100 ± 100	122 ± 0.4
2	ASD-CAPW3305	MS 3106A-24-11S	5000 ± 100	197 ± 0.4	5100 ± 100	201 ± 0.4

Encoder Connector

ASD-CAEN1000



Straight plug MS 3106-20-29S

DELTA ELECTRONICS, INC.

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ASDA-AB_C_EN_20100601

DELTA ELECTRONICS, INC.

ASDA-AB

DELTA ASDA-AB AC Servo System

www.delta.com.tw/industrialautomation

Model Name Explanation

ASDA-AB Series Servo Drive

ASD - A 04 21 - AB

Product Name
ASD : AC Servo Drive

Product Series
A: A series

Rated Output Power

01:100W	10:1KW
02:200W	15:1.5KW
04:400W	20:2KW
07:750W	30:3KW

Input Voltage and Phase
11 : 110V Single-phase
21 : 220V Single-phase
23 : 220V Three-phase

Encoder Resolution
A : 2500ppr

Specified Machine
B : Support ECMA series servo motor

ASMT Series Servo Motor

A S M T 0 1 L 2 5 0 A K

Product Name
ASM: AC Servo Motor

Motor Type
T : T Type

Rated Output Power

01:100W	10:1kW
02:200W	15:1.5kW
04:400W	20:2kW
07:750W	

L : Low Inertia
M : Medium Inertia

Encoder Resolution
250: 2500ppr

Electromagnetic Brake
A: Without Electromagnetic Brake
B: With Electromagnetic Brake

Symbol	With Keyway	Without Keyway
With Oil Seal	M	O
Without Oil Seal	K	–

ECMA Series Servo Motor

ECM A-C3 06 02 E S

Product Name
ECM: Electrical Commutation Motor

Driving Type
A: AC Servo Motor

Series
Rated Voltage / Rated Speed
C : 220V / 3000rpm
E : 220V / 2000rpm
G : 220V / 1000rpm
Encoder Type
3 : 2500ppr

Motor Frame Size
04 : 40mm 10 : 100mm
06 : 60mm 13 : 130mm
08 : 80mm 18 : 180mm

Rated Output Power
01 : 100W 05 : 500W 10 : 1kW
02 : 200W 06 : 600W 15 : 1.5kW
03 : 300W 07 : 750W 20 : 2kW
04 : 400W 09 : 900W 30 : 3kW

Standard Shaft Dimensions: S
Specified Shaft Dimensions:
1 = 11mm, 9 = 19mm, 8 = 28mm
7 = 14mm, 2 = 22mm, 5 = 35mm
6 = 16mm, 4 = 24mm, 3 = 42mm

Shaft Type and Oil Seal	No Brake No Oil Seal	With Brake No Oil Seal	No Brake With Oil Seal	With Brake With Oil Seal
Round Shaft	A	B	C	D
Keyway	E	F	G	H
Keyway (with screw hole)	P	Q	R	S

AC Servo System

Servo Drive and Servo Motor Combinations

Power	Servo Drive		Servo Motor (ECMA Series)		Servo Motor (ASMT Series)	
100W	ASD-A0121-AB ASD-A0111-AB		ECMA-C30401☐S(S=8mm)		ASMT01L250☐☐	
200W	ASD-A0221-AB ASD-A0211-AB		ECMA-C30602☐S(S=14mm)		ASMT02L250☐☐	
400W	ASD-A0421-AB ASD-A0411-AB		ECMA-C30604☐S(S=14mm) ECMA-C30804☐7(7=14mm) ECMA-E31305☐S(S=22mm) ECMA-G31303☐S(S=22mm)		ASMT04L250☐☐	
750W	ASD-A0721-AB		ECMA-C30807☐S(S=19mm) ECMA-G31306☐S(S=22mm)		ASMT07L250☐☐	
1000W	ASD-A1021-AB		ECMA-C31010☐S(S=22mm) ECMA-E31310☐S(S=22mm) ECMA-G31309☐S(S=22mm)		ASMT10L250☐☐ ASMT10M250☐☐	
1500W	ASD-A1521-AB		ECMA-E31315☐S(S=22mm)		ASMT15M250☐☐	
2000W	ASD-A2023-AB		ECMA-C31020☐S(S=22mm) ECMA-E31320☐S(S=22mm) ECMA-E31820☐S(S=35mm)		ASMT20L250☐☐ ASMT20M250☐☐	
3000W	ASD-A3023-AB		ECMA-E31830☐S(S=35mm)			

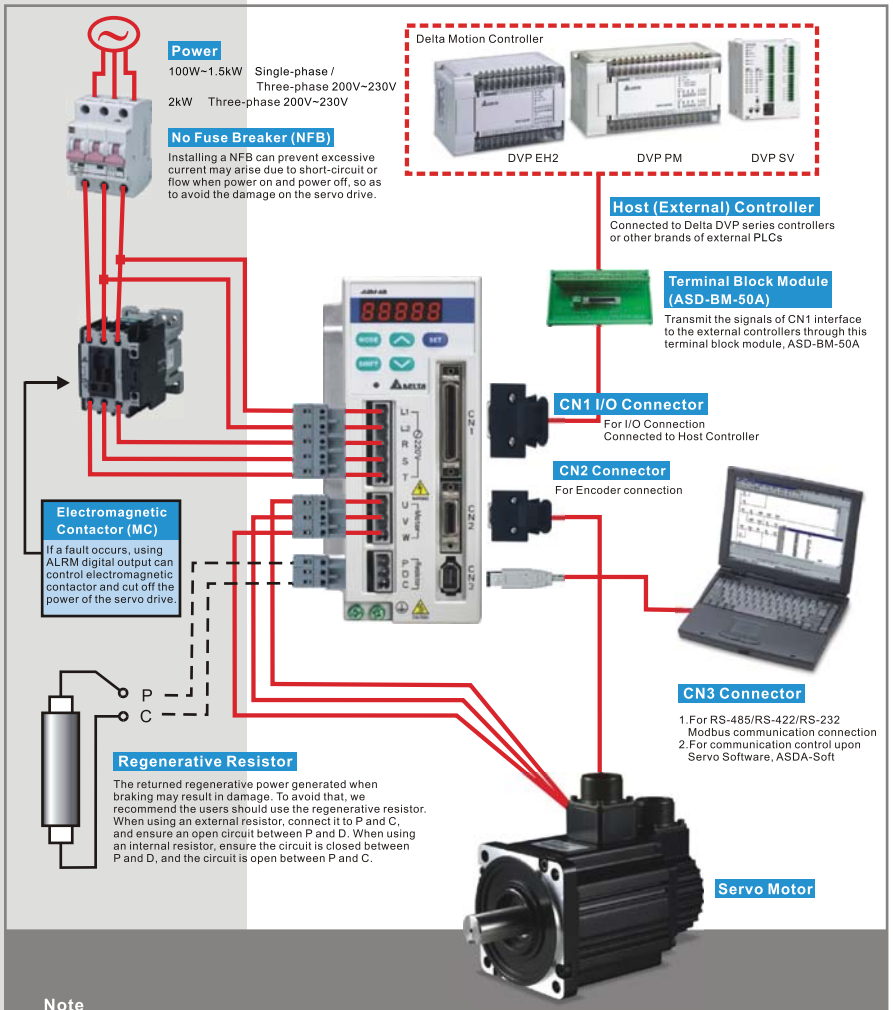
Note: ☐ The boxes in the model names are for optional configurations (brake, shaft type and oil seal).

AC Servo System

Configuration and Specifications

ASDA-AB

System Configuration



Note

1.Ensure to check if the power supply and wiring of the "power" terminals (R, S, T, & L1, L2) is correct.

2.Ensure to check if the wiring of the "servo motor output" terminals (U, V, & W) is correct.

Specifications of Servo Drive (ASDA-AB Series)

ASDA-AB Series			100W	200W	400W	100W	200W	400W	750W	1kW	1.5kW	2kW	3kW
			01	02	04	01	02	04	07	10	15	20	30
Power supply	Phase / Voltage		Three-phase: 170~255VAC, 50 / 60Hz±5% Single-phase: 200~255VAC, 50 / 60Hz±5%									Three-phase: 170~255VAC, 50 / 60Hz±5%	
	Continuous Output Current		1.1 Arms	1.7 Arms	3.3 Arms	1.1 Arms	1.7 Arms	3.3 Arms	5.0 Arms	6.8 Arms	10.6 Arms	13.4 Arms	17.5 Arms
Cooling System			Natural Air Circulation						Fan Cooling				
Encoder Resolution / Feedback Resolution			2500ppr / 10000ppr										
Control of Main Circuit			SVPWM (Space Vector Pulse Width Modulation) Control										
Tuning Modes			Easy / Auto / Manual										
Dynamic Brake			Built-in										
Position Control Mode	Max. Input Pulse Frequency		Max. 500Kpps (Line driver) / Max. 200Kpps (Open collector)										
	Pulse Type		Pulse + Direction, A phase + B phase, CCW pulse + CW pulse										
	Command Source		External pulse train / Internal parameters										
	Smoothing Strategy		Low-pass and P-curve filter										
	Electronic Gear		Electronic gear N/M multiple N: 1 ~ 32767, M: 1:32767(1/50<N/M<200)										
	Torque Limit Operation		Set by parameters										
	Feed Forward Compensation		Set by parameters										
Speed Control Mode	Analog Input Command	Voltage Range	0~±10 Vdc										
		Input Resistance	10K Ω										
		Time Constant	2.2 μs										
	Speed Control Range*1		1:5000										
	Command Source		External analog signal / Internal parameters										
	Smoothing Strategy		Low-pass and S-curve filter										
	Torque Limit Operation		Set by parameters or via Analog input										
	Frequency Response Characteristic		Maximum 450Hz										
	Speed Accuracy *2 (at rated rotation speed)		0.01% or less at load fluctuation 0 to 100%										
			0.01% or less at power fluctuation ±10%										
			0.01% or less at ambient temperature fluctuation 0℃ to 55 ℃ (32℉ to 131℉)										
Torque Control Mode	Analog Input Command	Voltage Range	0~±10 Vdc										
		Input Resistance	10K Ω										
		Time Constant	2.2 μs										
	Command Source		External analog signal / Internal parameters										
	Smoothing Strategy		Low-pass filter										
	Speed Limit Operation		Parameter Setting or via Analog input										
Analog Monitor Output			Monitor signal can set by parameters (Output voltage range: ±8V)										
Digital Input/Output	Input		Servo On, Reset, Gain switching, Pulse clear, Zero speed CLAMP, Speed/ Torque limit enabled, Emergency stop, Forward / Reverse inhibit limit, Position / Speed mode switching, Speed / Torque mode switching, Torque / Position mode switching, Feed step selection input, Feed step mode input, Auto run input, Electronic gear ratio (Numerator) selection										
	Output		Encoder signal output (A, B, Z Line Driver / Z Open collector) Servo ready, Servo On, At Zero speed, At Speed reached, At Positioning completed, At Torques limit, Servo alarm (Servo fault) activated, Electromagnetic brake control, Homing completed, Output overload warning Servo warning activated, Internal position command completed										
Protective Functions			Overcurrent, Overvoltage, Undervoltage, Motor overheated, Regeneration error, Overload, Overspeed, Abnormal pulse control command, Excessive deviation, Watch dog execution time out, Encoder error, Adjustment error, Emergency stop activated, Reverse/ Forward limit switch error, Memory error, DSP communication error, Serial communication error, Input power phase loss, Serial communication time out, Command write-in error,short circuit protection of U, V, W, and CN1, CN2, CN3 terminals										
Communication Interface			RS-232 / RS-485 / RS-422										
Environment	Installation Site		Indoor location (free from direct sunlight), no corrosive liquid and gas (far away from oil mist, flammable gas, dust)										
	Altitude		Altitude 1000m or lower above sea level										
	Atmospheric pressure		86kPa~106kPa										
	Operating Temperature		0℃ to 55 ℃ (32℉ to 131℉) (If operating temperature is above specified range, forced cooling will be required)										
	Storage Temperature		-20℃ ~65℃ (-4℉ to 149℉)										
	Humidity		0~90% (non-condensing)										
	Vibration		9.80665m/s² (1G) , less than 20Hz, 5.88m/s² (0.6G)20 to 50Hz										
	IP Rating		IP20										
	Power System		TNSystem*3										
	Approvals												

*1 Rated rotation speed: When full load, speed ratio is defined as the minimum speed (the motor will not pause).
*2 When command is rated rotation speed, the speed fluctuation rate is defined as: (Empty load rotation speed Full load rotation speed) / Rated rotation speed
*3 TN system: A power distribution system having one point directly earthed, the exposed conductive parts of the installation being connected to that points by protective earth conductor.

AC Servo System

Specifications of Servo Motor

(ECMA) Low Inertia Servo Motor Specifications

Model: ECMA Series	C304	C306		C308		C310	
	01	02	04	04	07	10	20
Rated output power (kW)	0.1	0.2	0.4	0.4	0.75	1.0	2.0
Rated torque (N-m) *1	0.32	0.64	1.27	1.27	2.39	3.18	6.37
Maximum torque (N-m)	0.96	1.92	3.82	3.82	7.16	9.54	19.11
Rated speed (r/min)	3000						
Maximum speed (r/min)	5000						
Rated current (A)	0.9	1.55	2.6	2.6	5.1	7.3	12.05
Maximum current (A)	2.7	4.65	7.8	7.74	15.3	21.9	36.15
Power rating (kW/s) (without brake)	27.7	22.4	57.6	22.1	48.4	38.1	90.6
Rotor moment of inertia ($x10^{-4}$kg.m^2) (without brake)	0.037	0.177	0.277	0.68	1.13	2.65	4.45
Mechanical time constant (ms) (without brake)	0.75	0.80	0.53	0.73	0.62	0.74	0.61
Torque constant-KT (N-m/A)	0.36	0.41	0.49	0.49	0.47	0.44	0.53
Voltage constant-KE (mV/(r/min))	13.6	16	17.4	18.5	17.2	16.8	19.2
Armature resistance (Ohm)	9.3	2.79	1.55	0.93	0.42	0.20	0.13
Armature inductance (mH)	24	12.07	6.71	7.39	3.53	1.81	1.50
Electrical time constant (ms)	2.58	4.3	4.3	7.96	8.36	9.3	11.4
Insulation class	Class A (UL), Class B (CE)						
Insulation resistance	100MΩ , DC 500V						
Insulation strength	AC 1500 V, 60 seconds						
Weight (kg) (without brake)	0.5	1.2	1.6	2.1	3.0	4.3	6.2
Weight (kg) (with brake)	0.8	1.5	2.0	2.9	3.8	4.7	7.2
Max. radial shaft load (N)	78.4	196	196	245	245	490	490
Max. thrust shaft load (N)	39.2	68	68	98	98	98	98
Power rating (kW/s) (with brake)	25.6	21.3	53.8	22.1	48.4	30.4	82
Rotor moment of inertia ($x10^{-4}$Kg.m^2) (with brake)	0.04	0.192	0.30	0.73	1.18	3.33	4.95
Mechanical time constant (ms) (with brake)	0.81	0.85	0.57	0.78	0.65	0.93	0.66
Brake holding torque [Nt-m (min)]	0.3	1.3	1.3	2.5	2.5	8.0	8.0
Brake power consumption (at 20°C) [W]	7.2	6.5	6.5	8.2	8.2	18.5	18.5
Brake release time [ms (Max)]	5	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	25	70	70	70	70	70	70
Vibration grade (um)	15						
Operating temperature	0°C to 40°C (32°F to 104°F)						
Storage temperature	-10°C to 80 °C (-14°F to 176°F)						
Operating humidity	20% to 90% RH (non-condensing)						
Storage humidity	20% to 90% RH (non-condensing)						
Vibration capacity	2.5G						
IP rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))						
Approvals	CE cULus						

Footnote: *1 Rate torque values are continuous permissible values at 0~40°C ambient temperature when attaching with the sizes of heatsinks listed below:
ECMA-__04 / 06 / 08 : 250mm x 250mm x 6mm ; ECMA-__10 : 300mm x 300mm x 12mm
ECMA-__13 : 400mm x 400mm x 20mm ; ECMA-__18 : 550mm x 550mm x 30mm
Material type : Aluminum F40, F60, F80, F100, F130, F180

(ECMA) Medium / High Inertia Servo Motor Specifications

Model: ECMA Series	E313				E318		G313		
	05	10	15	20	20	30	03	06	09
Rated output power (kW)	0.5	1.0	1.5	2.0	2.0	3.0	0.3	0.6	0.9
Rated torque (N-m) *1	2.39	4.77	7.16	9.55	9.55	14.32	2.86	5.73	8.59
Maximum torque (N-m)	7.16	14.32	21.48	28.65	28.65	42.97	8.59	17.19	21.48
Rated speed (r/min)	2000						1000		
Maximum speed (r/min)	3000						2000		
Rated current (A)	2.9	5.6	8.3	11.01	11.22	16.1	2.5	4.8	7.5
Maximum current (A)	8.7	16.8	24.81	33.0	33.66	48.3	7.44	14.49	22.5
Power rating (kW/s) (without brake)	7.0	27.1	45.9	62.5	26.3	37.3	10.0	39.0	66.0
Rotor moment of inertia ($x10^{-4}$kg.m^2)(without brake)	8.17	8.41	11.18	14.59	34.68	54.95	8.17	8.41	11.18
Mechanical time constant (ms) (without brake)	1.91	1.51	1.11	0.96	1.62	1.06	1.84	1.40	1.07
Torque constant-KT (N-m/A)	0.83	0.85	0.87	0.87	0.85	0.89	1.15	1.19	1.15
Voltage constant-KE (mV/(r/min))	30.9	31.9	31.8	31.8	31.4	32.0	42.5	43.8	41.6
Armature resistance (Ohm)	0.57	0.47	0.26	0.174	0.119	0.052	1.06	0.82	0.43
Armature inductance (mH)	7.39	5.99	4.01	2.76	2.84	1.38	14.29	11.12	6.97
Electrical time constant (ms)	12.96	12.88	15.31	15.86	23.87	26.39	13.55	13.55	16.06
Insulation class	Class A (UL), Class B (CE)								
Insulation resistance	100MΩ , DC 500V								
Insulation strength	AC 1500 V, 60 seconds								
Weight (kg) (without brake)	6.8	7	7.5	7.8	13.5	18.5	6.8	7	7.5
Weight (kg) (with brake)	8.2	8.4	8.9	9.2	17.5	22.5	8.2	8.4	8.9
Max. radial shaft load (N)	490	490	490	490	1176	1470	490	490	490
Max. thrust shaft load (N)	98	98	98	98	490	490	98	98	98
Power rating (kW/s) (with brake)	6.4	24.9	43.1	59.7	24.1	35.9	9.2	35.9	62.1
Rotor moment of inertia ($x10^{-4}$Kg.m^2) (with brake)	8.94	9.14	11.90	15.88	37.86	57.06	8.94	9.14	11.9
Mechanical time constant (ms) (with brake)	2.07	1.64	1.19	1.05	1.77	1.10	2.0	1.51	1.13
Brake holding torque [Nt-m (min)]	10.0	10.0	10.0	10.0	25.0	25.0	10.0	10.0	10.0
Brake power consumption (at 20°C) [W]	19.0	19.0	19.0	19.0	20.1	20.1	19.0	19.0	19.0
Brake release time [ms (Max)]	10	10	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70	70	70	70	70
Vibration grade (um)	15								
Operating temperature	0°C to 40°C (32°F to 104°F)								
Storage temperature	-10°C to 80 °C (-14°F to 176°F)								
Operating humidity	20% to 90% RH (non-condensing)								
Storage humidity	20% to 90% RH (non-condensing)								
Vibration capacity	2.5G								
IP rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))								
Approvals	CE cULus								

Footnote: *1 Rate torque values are continuous permissible values at 0~40°C ambient temperature when attaching with the sizes of heatsinks listed below:
ECMA-__04 / 06 / 08 : 250mm x 250mm x 6mm ; ECMA-__10 : 300mm x 300mm x 12mm
ECMA-__13 : 400mm x 400mm x 20mm ; ECMA-__18 : 550mm x 550mm x 30mm
Material type : Aluminum F40, F60, F80, F100, F130, F180

Specifications of Servo Motor

(ASMT□L) Low Inertia Servo Motor Specifications

Model: ASMT□□L250□□		100W	200W	400W	750W	1kW	2kW
		01	02	04	07	10	20
Specifications	Rated output power (kW)	0.1	0.2	0.4	0.75	1.0	2.0
	Rated torque (N-m)	0.318	0.64	1.27	2.39	3.3	6.8
	Maximum torque (N-m)	0.95	1.91	3.82	7.16	9.9	19.2
	Rated speed (r/min)	3000					
	Maximum speed (r/min)	5000					4500
	Rated current (A)	1.1	1.7	3.3	5.0	6.8	13.4
	Maximum current (A)	3.0	4.9	9.3	14.1	18.7	38.4
	Power rating (kW/s)	34.5	23.0	48.7	51.3	42	98
	Rotor moment of inertia ($Kg.m^2$) (without brake)	0.03E-4	0.18E-4	0.34E-4	1.08E-4	2.6E-4	4.7E-4
	Mechanical time constant (ms)	0.6	0.9	0.7	0.6	1.7	1.2
	Static friction torque (N-m)	0.02	0.04	0.04	0.08	0.49	0.49
	Torque constant-KT (N-m/A)	0.32	0.39	0.4	0.5	0.56	0.54
	Voltage constant-KE (mV/(r/min))	33.7E-3	41.0E-3	41.6E-3	52.2E-3	58.4E-3	57.0E-3
	Armature resistance (Ohm)	20.3	7.5	3.1	1.3	2.052	0.765
	Armature inductance (mH)	32	24	11	6.3	8.4	3.45
	Electrical time constant (ms)	1.6	3.2	3.2	4.8	4.1	4.5
	Insulation class	Class F					
	Insulation resistance	DC 500V , 100M Ω					
	Insulation strength	AC 1500 V, 50 Hz, 60 seconds					
	Max. radial shaft load (N)	78.4	196	196	343	490	490
	Max. thrust shaft load (N)	39.2	68.6	68.6	98	98	98
	Vibration grade (um)	15					
	DC brake power (V)	24□10%					
	Rotor moment of inertia ($Kg.m^2$) (with brake)	0.06E-4	0.28E-4	0.44E-4	1.32E-4	3.1E-4	5.2E-4
	Brake holding torque [Nt-m (min)]	0.32	1.27	1.27	2.55	9.3	9.3
	Brake power consumption (at 20 ℃) [W]	5	9	9	9.5	17.9	17.9
	Brake release time [ms (Max)]	20	20	20	50	20	20
	Brake pull-in time [ms (Max)]	40	50	50	80	90	90
Environment	Operating temperature	0℃ to 40℃ (32℉ to 104℉)					
	Storage temperature	-20℃ to 70 ℃ (-4℉ to 158℉)					
	Operating humidity	20% to 90% RH (non-condensing)					
	Storage humidity	20% to 90% RH (non-condensing)					
	Vibration capacity	2.5G					
	IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))					
	Approvals	IEC60034-1, UI1004 CE cULus					

(ASMT□M) Medium Inertia Servo Motor Specifications

Model: ASMT□□M250□□		1kW	1.5kW	2kW
		10	15	20
Specifications	Rated output power (kW)	1.0	1.5	2.0
	Rated torque (N-m)	4.8	7.16	9.4
	Maximum torque (N-m)	15.7	21.5	23.5
	Rated speed (r/min)	2000		
	Maximum speed (r/min)	3000		
	Rated current (A)	5.6	10.6	13.1
	Maximum current (A)	17.6	30.3	31.4
	Power rating (kW/s)	38.4	58.3	55.6
	Rotor moment of inertia ($Kg.m^2$) (without brake)	5.98E-4	8.79E-4	15.8E-4
	Mechanical time constant (ms)	1.4	1.3	1.6
	Static friction torque (N-m)	0.29	0.5	0.98
	Torque constant-KT (N-m/A)	0.91	0.73	0.77
	Voltage constant-KE (mV/(r/min))	95.71E-3	76.0E-3	81.1E-3
	Armature resistance (Ohm)	1.98	0.828	0.6
	Armature inductance (mH)	13.2	5.5	6.1
	Electrical time constant (ms)	6.7	6.6	10.1
	Insulation class	Class F		
	Insulation resistance	DC 500V , 100M Ω		
	Insulation strength	AC 1500 V, 50 Hz, 60 seconds		
	Max. radial shaft load (N)	490	490	784
	Max. thrust shaft load (N)	98	98	396
	Vibration grade (um)	15		
	DC brake power (V)	24□10%		
	Rotor moment of inertia ($Kg.m^2$) (with brake)	8.77E-4	11.57E-4	27.8E-4
	Brake holding torque [Nt-m (min)]	7.5	10.5	32
	Brake power consumption (at 20 ℃) [W]	20	30	34.7
	Brake release time [ms (Max)]	20	20	50
	Brake pull-in time [ms (Max)]	90	90	170
Environment	Operating temperature	0℃ to 40℃ (32℉ to 104℉)		
	Storage temperature	-20℃ to 70 ℃ (-4℉ to 158℉)		
	Operating humidity	20% to 90% RH (non-condensing)		
	Storage humidity	20% to 90% RH (non-condensing)		
	Vibration capacity	2.5G		
	IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))		
	Approvals	IEC60034-1, UI1004 CE cULus		

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DELTA ELECTRONICS, INC.

ASDA-A

DELTA ASDA-A AC Servo System

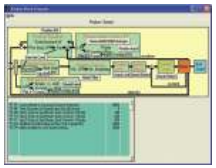
www.delta.com.tw/industrialautomation

Features

Window based Software

Operation is child's play.

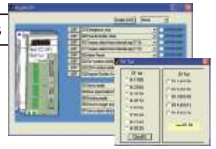
Parameter management
- Clear parameters classification. Easy to view
- Detailed parameters explanation. Easy to understand.
- Real-time parameters setting. Fast and convenient.
- Complete read and write function



System Block Diagram
- Quick and simply to understand system structure
- Promptly acknowledge the relevant parameters in different control mode

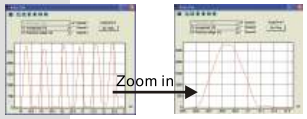
Calculation Tool
According to the mechanical moving distance calculate the corresponding internal pulse number automatically

Many auxiliary functions



Software selectable virtual I/O
User-definable I/O points
Virtual software "I/O switch"button

Digital oscilloscope feature
Graphical display of internal signals, similar to a digital oscilloscope
Quickly show and record drive status.
On-line monitoring is uncomplicated.



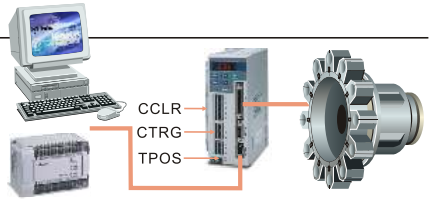
JOG mode and Position Teaching function
Reach and save the user-desired position through JOG operation.

Drive all status monitor function available.

Single-axis Control Function

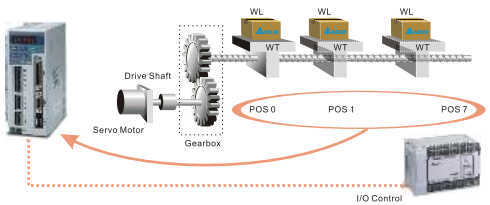
Feed step control

PC-based controller and PLC can achieve feed step control, torque auto reduction and position error clear function via communication or DI/DO signals. Feed step control function can greatly reduce the power consumption and improve the motor overheat problem caused by the mechanical engagement error during positioning.
Main applications: Turret control machinery, Cutting tool processing, feeding and assembly system



Single-axis positioning control

Built-in 8 position commands and 8 corresponding moving speed settings. When using communication control, it can change internal command and moving speed dynamically.
Position control with unlimited numbers of points via communication is possible.



Model Explanation

Servo Drive ASDA-A Series

ASD - A 04 21 L A

- Product Name: ASD: AC Servo Drive
- Series: A : A Series
- Rated Output Power: 01:100W 10:1KW; 02:200W 15:1.5KW; 04:400W 20:2KW; 07:750W 30:3KW
- Input Voltage and Phase: 21 : 220V 1-Phase; 23 : 220V 3-Phase
- Motor Inertia: L: Low Inertia; M: Medium Inertia
- Version

Servo Motor Series

ASM T 01 L 250 A K

- Product Name: ASM: AC Servo Motor
- Series: T : T Type
- Rated Output Power: 01:100W 10:1KW; 02:200W 15:1.5KW; 04:400W 20:2KW; 07:750W 30:3KW
- M : Medium Inertia; L : Low Inertia
- Encoder Resolution: 250: 2500ppr; 20B:20bit (Developing)
- Electromagnetic Brake: A: Without electromagnetic brake; B: With electromagnetic brake
- Symbol / Keyway / With Oil Seal

Symbol	Keyway	With Oil Seal
K	Yes	No
O	No	Yes
M	Yes	Yes

Servo Drive Specifications (ASDA-A Series)

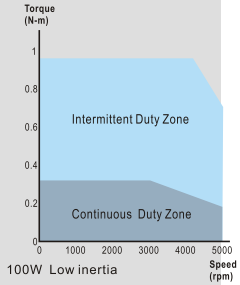
Model: ASD-A□□□□□□			01	02	04	07	10	15	20	30
Power supply	Phase / Voltage		Three-phase or Single-phase 220VAC						Three-phase 220VAC	
	Permissible Voltage Range		Three-phase: 170~255VAC Single-phase: 200~255VAC						170~255VAC	
	Permissible Frequency Range		50 / 60 Hz±5%							
Cooling System			Natural Air Circulation			Fan Cooling				
Encoder Resolution /Feedback Resolution			2500ppr/10000ppr							
Control of Main Circuit			SVPWM Control							
Tuning Modes			Easy / Auto / Manual							
Dynamic Brake			Built-in							
Power supply	Max. Input Pulse Frequency		Max. 500KPPS (Line driver) / Max. 200KPPS (Open collector)							
	Pulse Type		Pulse + Direction, A phase + B phase, CCW pulse + CW pulse							
	Command Source		External pulse train / Internal parameters							
	Smoothing Strategy		Low-pass and P-curve filter							
	Electronic Gear		Electronic gear N/M multiple N: 1~32767, M: 1:32767(1/50<N/M<200)							
	Torque Limit Operation		Set by parameters							
	Feed Forward Compensation		Set by parameters							
Position Control Mode	Analog Input Command	Voltage Range	0~±10 VDC							
		Input Resistance	10K Ω							
		Time Constant	2.2 μs							
	Speed Control Range[*1]		1:5000							
	Command Source		External analog signal / Internal parameters							
	Smoothing Strategy		Low-pass and S-curve filter							
	Torque Limit Operation		Set by parameters or via Analog input							
	Responsiveness Characteristic		Maximum 450Hz							
	Speed Fluctuation Rate[*2]		0.01% or less at load fluctuation 0 to 100% (at rated speed)							
			0.01% or less at power fluctuation ±10% (at rated speed)							
			0.01% or less at ambient temperature fluctuation 0°C to 50°C (at rated speed)							
Speed Control Mode	Analog Input Command	Voltage Range	0~±10 VDC							
		Input Resistance	10K Ω							
		Time Constant	2.2 μs							
	Permissible Time for Overload		8 sec. Under 200% rated output							
	Command Source		External analog signal / Internal parameters							
	Smoothing Strategy		Low-pass filter							
	Speed Limit Operation		Parameter Setting or via Analog input							
Analog Monitor Output			Monitor signal can set by parameters (Output voltage range: ±8V)							
Digital Input/Output		Input	Servo On, Reset, Gain switching, Pulse clear, Low speed CLAMP, Speed/Torque limit enabled, Emergency stop, Forward / Reverse inhibit limit, Pulse inhibit input, Forward / Reverse JOG input							
			Internal parameter selection, Torque limit activation, Speed limit activation, Control mode selection (Position / Speed / Torque mode selection, Dual mode selection), Feed step control mode, Internal auto running mode, Electronic gear ratio selection							
		Output	Encoder signal output (A, B, Z Line Driver / Z Open collector)							
			Servo ready, Servo On, Zero speed, Speed reached, Positioning completed, At torques limit, Servo alarm output (Servo fault), Electromagnetic brake, Home completed							
Protective Functions			Overcurrent, Overvoltage, Undervoltage, Motor overheated, Regeneration error, Overload, Overspeed, Abnormal pulse control command, Excessive deviation, Watch dog execution time out, Encoder error, Adjustment error, Emergency stop activated, Reverse/ Forward limit switch error, IGBT temperature error, Memory error, DSP communication error, Serial communication error, Input power phase loss, Serial communication time out, Command write-in error							
Communication Interface			RS-232/RS-485/RS-422							
Environment		Installation Site	Indoor location (free from direct sunlight), no corrosive liquid and gas (far away from oil mist, flammable gas, dust)							
		Altitude	Altitude 1000m or lower above sea level							
		Atmospheric pressure	86kPA to 106kPA							
		Operating Temperature	0°C to 55°C (If operating temperature is above specified range, forced cooling will be required)							
		Storage Temperature	-20°C~65°C(-4°F~149°F)							
		Humidity	0 to 90% (non-condensing)							
		Vibration	9.80665m/s² (1G) less than 20Hz, 5.88m/ s² (0.6G) 20 to 50Hz							
		Terminals with Short Circuit Protection	U, V, W, CN1, CN2, Cn3							
		Power System	TN System[*3]							
		Standards/ Requirement	IEC / EN 61800-5-1, UI508, TUV, C-tick CE cULus							

Low Inertia Servo Motor Specifications (ASMT□L Series)

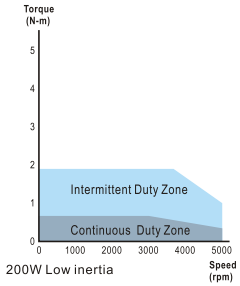
Model: ASMT□□L250□□		100W	200W	400W	750W	1kW	2kW	3kW
		01	02	04	07	10	20	30
Specifications	Rated output power (kW)	0.1	0.2	0.4	0.75	1.0	2.0	3.0
	Rated torque (N.m)	0.318	0.64	1.27	2.39	3.3	6.8	9.5
	Maximum torque (N.m)	0.95	1.91	3.82	7.16	9.9	19.2	31.5
	Rated speed (rpm)	3000						
	Maximum speed (rpm)	5000					4500	
	Rated current (A)	1.1	1.7	3.3	5.0	6.8	13.4	17.5
	Maximum current (A)	3.0	4.9	9.3	14.1	18.7	38.4	55
	Power rating (kW/s)	34.5	23.0	48.7	51.3	42	98	95.1
	Rotor moment of inertia (Kg.m²) (without brake)	0.03E-4	0.18E-4	0.34E-4	1.08E-4	2.6E-4	4.7E-4	11.6E-4
	Mechanical time constant (ms)	0.6	0.9	0.7	0.6	1.7	1.2	1.5
	Static friction torque (N.m)	0.02	0.04	0.04	0.08	0.49	0.49	0.49
	Torque constant-KT (N.m/A)	0.32	0.39	0.4	0.5	0.56	0.54	0.581
	Voltage constant-KE (V/rpm)	33.7E-3	41.0E-3	41.6E-3	52.2E-3	58.4E-3	57.0E-3	60.9E-3
	Armature resistance (Ohm)	20.3	7.5	3.1	1.3	2.052	0.765	0.32
	Armature inductance (mH)	32	24	11	6.3	8.4	3.45	2.63
	Electrical time constant (ms)	1.6	3.2	3.2	4.8	4.1	4.5	8.2
	Insulation class	Class F						
	Insulation resistance	DC 500V , 100M Ω以上						
	Insulation strength	AC 1500 V, 50 Hz, 60 sec						
	Max. radial shaft load (N)	78.4	196	196	343	490	490	490
	Max. thrust shaft load (N)	39.2	68.6	68.6	98	98	98	98
	Vibration grade (um)	15						
	DC brake power (V)	24±10%						
	Rotor moment of inertia (Kg.m²) (with brake)	0.06E-4	0.28E-4	0.44E-4	1.32E-4	3.1E-4	5.2E-4	14.39E-4
	Brake holding torque [Nt-m (min)]	0.32	1.27	1.27	2.55	9.3	9.3	13.5
	Brake power consumption (at 20 °C) [W]	5	9	9	9.5	17.9	17.9	30
	Brake release time [ms (Max)]	20	20	20	50	20	20	20
	Brake pull-in time [ms (Max)]	40	50	50	80	90	90	90
Environment	Operating temperature	0°C to 40°C (32°F to 104°F						
	Storage temperature	-20°C to 70°C (-4°F to 158°F)						
	Operating humidity	20 to 90%RH (non-condensing)						
	Storage humidity	20 to 90%RH (non-condensing)						
	Vibration capacity	2.5G						
	Enclosure Rating	IP65 (except shaft and connector)						
	Standards/Requirement	IEC60034-1, UI1004 CE cULus						

Specifications

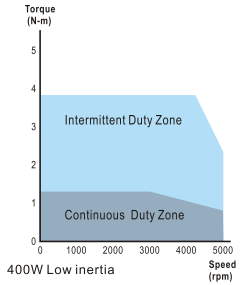
Speed-Torque Curves (ASMT □ L Series)



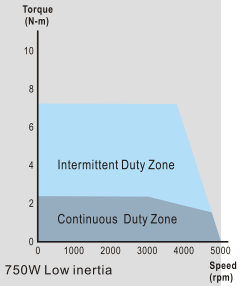
100W Low inertia



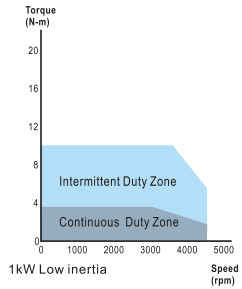
200W Low inertia



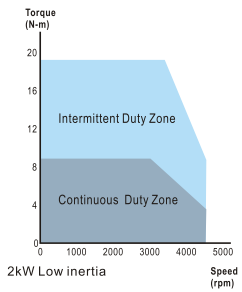
400W Low inertia



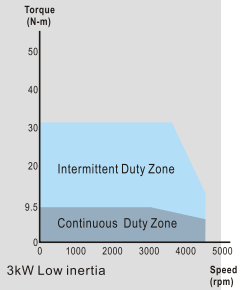
750W Low inertia



1kW Low inertia



2kW Low inertia



3kW Low inertia

Medium Inertia Servo Motor Specifications (ASMT □ M Series)

Model: ASMT□□M250□□		1kW	1.5kW	2kW	3kW
		10	15	20	30
Specifications	Rated output power (kW)	1.0	1.5	2.0	3.0
	Rated torque (N.m)	4.8	7.16	9.4	14.3
	Maximum torque (N.m)	15.7	21.5	23.5	35.8
	Rated speed (rpm)	2000			
	Maximum speed (rpm)	3000			
	Rated current (A)	5.6	10.6	13.1	17.4
	Maximum current (A)	17.6	30.3	31.4	42.3
	Power rating (kW/s)	38.4	58.3	55.6	47.2
	Rotor moment of inertia (Kg.m^2) (without brake)	5.98E-4	8.79E-4	15.8E-4	43.3E-4
	Mechanical time constant (ms)	1.4	1.3	1.6	0.9
	Static friction torque (N.m)	0.29	0.5	0.98	0.98
	Torque constant-KT (N.m/A)	0.91	0.73	0.77	0.86
	Voltage constant-KE (V/rpm)	95.71E-3	76.0E-3	81.1E-3	90.5E-3
	Armature resistance (Ohm)	1.98	0.828	0.6	0.162
	Armature inductance (mH)	13.2	5.5	8.1	2.3
	Electrical time constant (ms)	6.7	6.6	10.1	14.2
	Insulation class	Class F			
	Insulation resistance	>100MΩ, DC 500V			
	Insulation strength	AC 1500 V, 50 Hz, 60 seconds			
	Max. radial shaft load (N)	490	490	784	784
	Max. thrust shaft load (N)	98	98	392	392
	Vibration grade (um)	15			
	DC brake power (V)	24±10%			
	Rotor moment of inertia (Kg.m^2) (with brake)	8.77E-4	11.57E-4	27.8E-4	56.3E-4
	Brake holding torque [Nt-m (min)]	7.5	10.5	32	50
	Brake power consumption (at 20 °C) [W]	20	30	34.7	40
	Brake release time [ms (Max)]	20	20	50	140
	Brake pull-in time [ms (Max)]	90	90	170	110
Environment	Operating temperature	0°C to 40°C (32°F to 104°F)			
	Storage temperature	-20°C to 70°C (-4°F to 158°F)			
	Operating humidity	20~90%RH (non-condensing)			
	Storage humidity	20~90%RH (non-condensing)			
	Vibration capacity	2.5G			
	Enclosure Rating	IP65 (except shaft and connector)			
	Standards/Requirement	IEC60034-1, UI1004 CE UL			

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ASDA-B_C_EN_20090604

ASDA-B

DELTA ELECTRONICS, INC.

ASDA-B

DELTA ASDA-B AC Servo System

www.delta.com.tw/industrialautomation

AC Servo System

Model Explantion

ASDA-B

Servo Drive ASDA-B series

ASD - B 02 21 - A

- Product Name: ASD : AC Servo Drive
- Series: B : B series
- Rated Output Power: 01:100W 02:200W 04:400W 07:750W 10:1kW 15:1.5KW 20:2kW
- Input Voltage and Phase: 21 : 220V 1-Phase; 23 : 220V 3-Phase
- Version: A

Servo Motor ECMA series

ECM A - C3 06 02 E S

- Product Name : Electrical Commutation Motor
- Driving Type : A : AC ServoMotor
- Series / Rated Voltage / Rated Speed: C : 220V / 3000rpm; E : 220V / 2000rpm; G : 220V / 1000rpm; Sensor Type: 3 : 2500ppr
- Motor Frame Size: 04 : 40mm 10 : 100mm; 06 : 60mm 13 : 130mm; 08 : 80mm 18 : 180mm
- Rated Output Power: 01 : 100W 05 : 500W 10 : 1kW; 02 : 200W 06 : 600W 15 : 1.5kW; 03 : 300W 07 : 750W 20 : 2kW; 04 : 400W 09 : 900W
- Standard Shaft Dimensions : S; Specified Shaft Dimensions : 1 = 11mm, 9 = 19mm, 8 = 28mm, 7 = 14mm, 2 = 22mm, 5 = 35mm, 6 = 16mm, 4 = 24mm, 3 = 42mm

Shaft Type and Oil Seal	No brake No oil seal	With brake No oil Seal	No brake With oil seal	With brake With oil Seal
Round Shaft	A	B	C	D
Keyway	E	F	G	H
Keyway with screw hole	P	Q	R	S

Servo Drive and Servo Motor Combinations

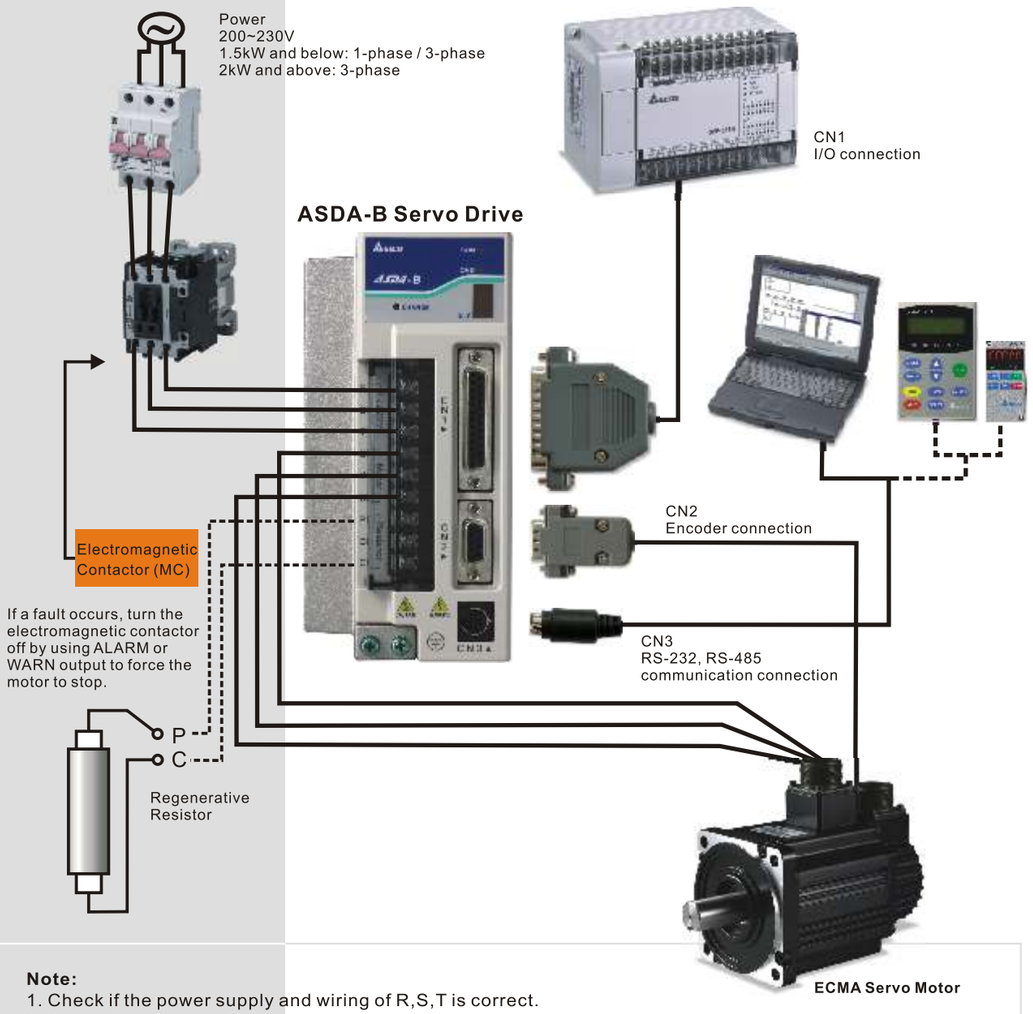
Servo Drive		Servo Motor
Power	Mode Name	
100W	ASD-B0121-A	ECMA-C30401□S(100W)
200W	ASD-B0221-A	ECMA-C30602□S(200W)
400W	ASD-B0421-A	ECMA-C30604□S(400W) ECMA-C30804□7(400W) ECMA-E31305□S(500W) ECMA-G31303□S(300W)
750W	ASD-B0721-A	ECMA-C30807□S(750W) ECMA-G31306□S(600W)
1000W	ASD-B1021-A	ECMA-C31010□S(1000W) ECMA-E31310□S(1000W) ECMA-G31309□S(900W)
1500W	ASD-B1521-A	ECMA-E31315□S(1500W)
2000W	ASD-B2023-A	ECMA-C31020□S(2000W) ECMA-E31320□S(2000W) ECMA-E31820□S(2000W)

Note : The boxes (□) at the ends of the model names are for shaft type or options (keyway, brake and oil seal).

Configuration

ASDA-B

System Configuration



Note:

1. Check if the power supply and wiring of R,S,T is correct.
2. Check if the wiring of U,V,W is correct.
3. When using an external regenerative resistor, ensure P and C is closed, and P and D is open.
   When using an internal regenerative resistor, connect regenerative resistor to P and D, and ensure an open circuit between P and C.
4. If an alarm displays or an enermgency stop occurs, turn the electromangetic contactor off by using ALARM or WARN output to force the motor to stop.
5. Delta provides two kinds of handheld digital keypad, ASD-PU-01A and ASD-PU-01B to meet the user's requirements.

Servo Drive Specifications (ASDA-B Series)

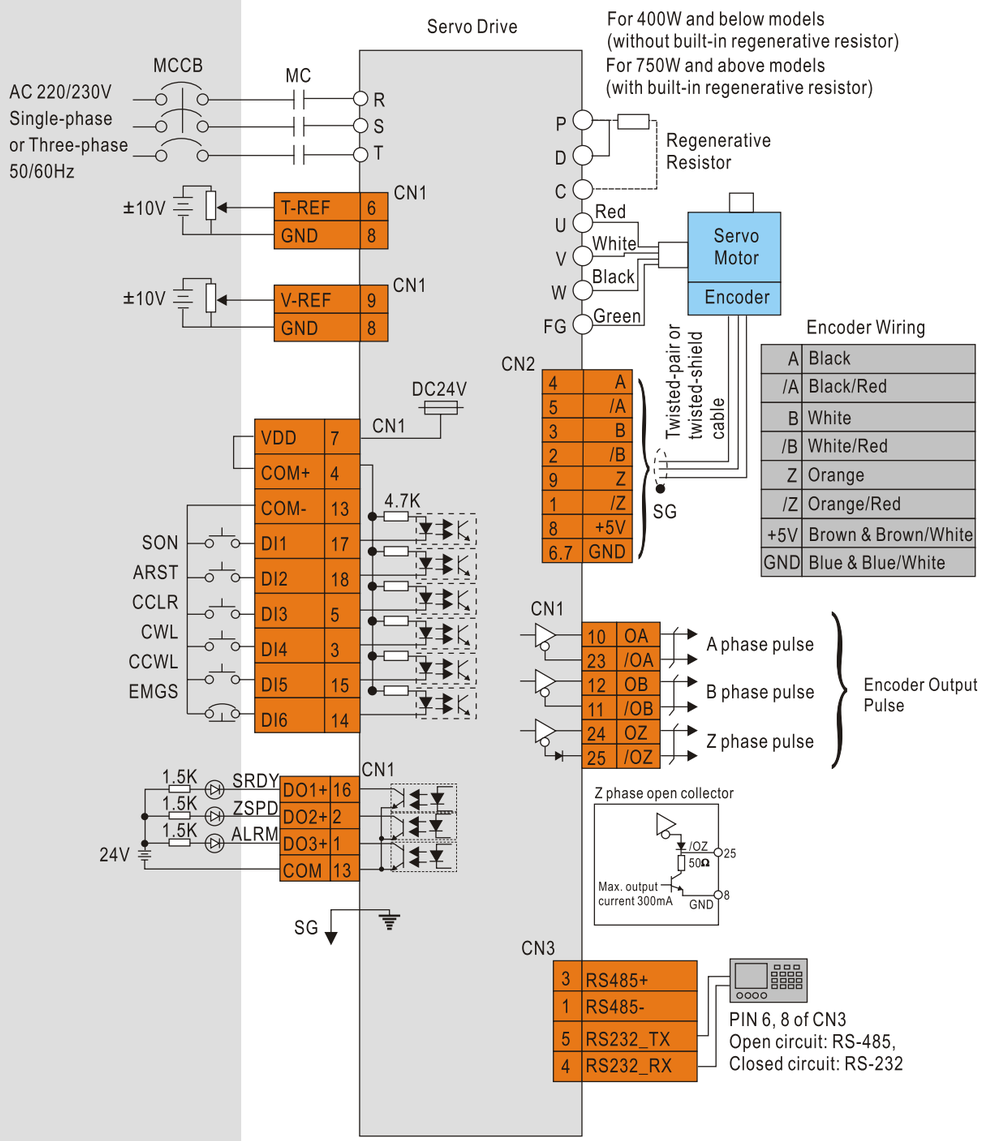
Mode : ASDA-B Series			01	02	04	07	10	15	20
Power supply	Voltage / Frequency		Three-phase or Single-phase 220VAC						Three-phase 220VAC
	Permissible Voltage Range		Three-phase or Single-phase 200~230VAC, -15%~10%						Three-phase 200~230VAC, -15%~10%
	Permissible Frequency Range		50 / 60 Hz ± 5%						
Cooling System			Natural Air Circulation				Fan Cooling		
Encoder Resolution / Feedback Resolution			2500ppr / 10000ppr						
Control of Main Circuit			SVPWM (Space Vector Pulse Width Modulation) Control						
Tuning Modes			Auto / Manual						
Regenerative Resistor			None			Built-in			
Position Control Mode	Max. Input Pulse Frequency		Max. 500KPPS (Line driver) / Max. 200KPPS (Open collector)						
	Pulse Type		Pulse + Direction, A phase + B phase, CCW pulse + CW pulse						
	Command Source		External pulse train						
	Smoothing Strategy		Low-pass smoothing filter						
	Electronic Gear		Electronic gear N/M multiple , N: 1~32767, M: 1:32767(1/50<N/M<200)						
	Torque Limit Operation		Set by parameters						
	Feed Forward Compensation		Set by parameters						
Speed Control Mode	Analog Input Command	Voltage Range	0~±10 VDC						
		Input Resistance	10K Ω						
		Time Constant	2.2 μs						
	Speed Control Range *1		1:5000						
	Command Source		External analog signal / Internal parameters						
	Smoothing Strategy		Low-pass and S-curve filter						
	Torque Limit Operation		Set by parameters						
	Frequency Response Characteristic		Maximum 250Hz						
	Speed Accuracy *2 (at rated rotation speed)		0.01% or less at load fluctuation 0 to 100%						
			0.01% or less at power fluctuation ±10%						
			0.01% or less at ambient temperature fluctuation 0 to 50 °C						
Torque Control Mode	Analog Input Command	Voltage Range	0~±10 VDC						
		Input Resistance	10K Ω						
		Time Constant	2.2 μs						
	Permissible Time for Overload		8 sec. Under 200% rated output						
	Command Source		External analog signal / Internal parameters						
	Smoothing Strategy		Low-pass smoothing filter						
	Speed Limit Operation		Set by parameters						
Digital Input/Output		Input	Servo On, Reset, Gain switching, Low speed CLAMP, Speed/Torque limit enabled, Emergency stop, Forward / Reverse inhibit limit						
			Internal parameter selection, Torque limit activation, Speed limit activation, Control mode selection (Position / Speed mode selection, Speed / Torque mode selection, Position / Torque mode selection)						
		Output	Encoder signal output (A, B, Z phase Line Driver / Z phase Open Collector)						
			Servo ready, Servo On, Zero speed, Speed reached, Positioning completed, Reached torques limits, Servo alarm output (Servo fault), Electromagnetic brake, Output Overload Warning, Servo Waming Output						
Protective Functions			Overcurrent, Overvoltage, Undervoltage, Motor overheated, Regeneration error, Overload,Overspeed, Excessive deviation, Encoder error, Emergency stop activated, Memory error, Serial communication error						
Communication Interface			RS-232 / RS-485						
Environment	Installation Site		Indoor location (free from direct sunlight), no corrosive liquid and gas (far away from oil mist, flammable gas, dust)						
	Altitude		Altitude 1000m or lower above sea level						
	Atmospheric pressure		86kPA to 106kPA						
	Operating Temperature		0°C to 45°C (If operating temperature is above specified range, forced cooling will be required)						
	Storage Temperature		-20°C to 65°C						
	Humidity		0 to 90% (non-condensing)						
	Vibration		10Hz ≦ F ≦ 57Hz 0.075mm 57Hz < F ≦ 150Hz 1G						
	IP rating		IP20						
	Power System		TN / TT System *3						
	Approvals		CE c-tick cULus						

* 1 Rated rotation speed: When full load, speed ratio is defined as the minimum speed (the motor will not pause).
* 2 When command is rated rotation speed, the speed fluctuation rate is defined as: (Empty load rotation speed Full load rotation speed) / Rated rotation speed
* 3 TN system: A power distribution system having one point directly earthed, the exposed conductive parts of the installation being connected to that points by protective earth conductor.
TT system: A power distribution system having one point directly earthed, the exposed conductive parts of the installation being connected to earth independent of the power system.

Standard Connection Example

ASDA-B

Torque(T) Control Mode



Servo Motor Specifications

Low Inertia Servo Motor

Model: ECMA Series	C304	C306		C308		C310	
	01	02	04	04	07	10	20
Rated output power (kW)	0.1	0.2	0.4	0.4	0.75	1.0	2.0
Rated torque (N.m)	0.32	0.64	1.27	1.27	2.39	3.18	6.37
Maximum torque (N.m)	0.96	1.92	3.82	3.82	7.16	9.54	19.11
Rated speed (rpm)	3000						
Maximum speed (rpm)	5000						
Rated current (A)	0.9	1.55	2.6	2.6	5.1	7.3	12.05
Maximum current (A)	2.7	4.60	7.8	7.8	15.3	21.9	36.15
Power rating (kW/s) (without brake)	27.7	22.4	57.6	24.0	50.4	38.1	90.6
Rotor moment of inertia ($Kg.m^2$) (without brake)	0.037E-4	0.177E-4	0.277E-4	0.68E-4	1.13E-4	2.65E-4	4.45E-4
Mechanical time constant (ms) (without brake)	0.75	0.80	0.53	0.74	0.63	0.74	0.61
Torque constant-KT (N.m/A)	0.36	0.41	0.49	0.49	0.47	0.44	0.53
Voltage constant-KE (mV/rpm)	13.6	16	17.4	18.5	17.2	16.8	19.2
Armature resistance (Ohm)	9.3	2.79	1.55	0.93	0.42	0.20	0.13
Armature inductance (mH)	24	12.07	6.71	7.39	3.53	1.81	1.50
Electrical time constant (ms)	2.58	4.3	4.3	7.96	8.37	9.3	11.4
Insulation class	Class A（UL）, Class B（CE）						
Insulation resistance	100MΩ, DC 500V						
Insulation strength	AC 1500 V, 60 seconds						
Weight (kg) (without brake)	0.5	1.2	1.6	2.1	3.0	4.3	6.2
Weight (kg) (with brake)	-	1.5	2.0	2.9	3.8	4.7	7.2
Max. radial shaft load (N)	78.4	196	196	245	245	490	490
Max. thrust shaft load (N)	39.2	68	68	98	98	98	98
Power rating (kW/s) (with brake)	-	21.3	53.8	22.1	48.4	30.4	82
Rotor moment of inertia (Kg.m2) (with brake)	-	0.192E-4	0.30E-4	0.73E-4	1.18E-4	3.33E-4	4.953E-4
Mechanical time constant (ms) (with brake)	-	0.85	0.57	0.78	0.65	0.93	0.66
Brake holding torque [Nt-m (min)]	-	1.3	1.3	2.5	2.5	12	12
Brake power consumption (at 20 °C) [W]	-	7.2	7.2	8.5	8.5	19.4	19.4
Brake release time [ms (Max)]	-	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	-	70	70	70	70	70	70
Vibration grade (um)	15						
Operating temperature	0 to 40°C(32 to 104°F)						
Storage temperature	-10 to 80°C(-14 to 176°F)						
Operating humidity	20~90%RH (non-condensing)						
Storage humidity	20~90%RH (non-condensing)						
Vibration capacity	2.5G						
IP rating	IP65 (using waterproof connectors and shaft seal installation (or using oil seal models))						
Approvals	CE cULus						

Standard Connection Example

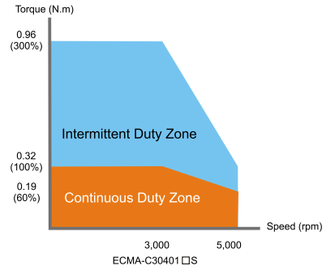
ASDA-B

Servo Motor Specifications

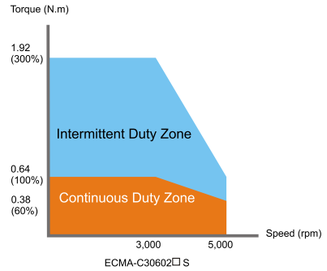
Medium / High Inertia Servo Motor

Model: ECMA Series	E313				E318	G313		
	05	10	15	20	20	03	06	09
Rated output power (kW)	0.5	1.0	1.5	2.0	2.0	0.3	0.6	0.9
Rated torque (N.m)	2.39	4.77	7.16	9.55	9.55	2.86	5.73	8.59
Maximum torque (N.m)	7.16	14.3	21.48	28.65	28.65	8.59	17.19	21.48
Rated speed (rpm)	2000					1000		
Maximum speed (rpm)	3000					2000		
Rated current (A)	2.9	5.6	8.3	11.01	11.22	2.5	4.8	7.5
Maximum current (A)	8.7	16.8	24.9	33.03	33.66	7.5	14.4	22.5
Power rating (kW/s) (without brake)	7	27.1	45.9	62.5	26.3	10.0	39.0	66.0
Rotor moment of inertia ($Kg.m^2$) (without brake)	8.17E-4	8.41E-4	11.18E-4	14.59E-4	34.68E-4	8.17E-4	8.41E-4	11.18E-4
Mechanical time constant (ms) (without brake)	1.91	1.51	1.10	0.96	1.62	1.82	1.40	1.06
Torque constant-KT (N.m/A)	0.83	0.85	0.87	0.87	0.85	1.15	1.19	1.15
Voltage constant-KE (mV/rpm)	30.9	31.9	31.8	31.8	31.4	42.5	43.8	41.6
Armature resistance (Ohm)	0.57	0.47	0.26	0.174	0.119	1.06	0.82	0.43
Armature inductance (mH)	7.39	5.99	4.01	2.76	2.84	14.29	11.12	6.97
Electrical time constant (ms)	12.96	12.88	15.31	15.86	23.87	13.55	13.50	16.06
Insulation class	Class A（UL）, Class B（CE）							
Insulation resistance	100MΩ , DC 500V							
Insulation strength	AC 1500 V, 60 secretary							
Weight (kg) (without brake)	6.8	7	7.5	7.8	13.5	6.8	7	7.5
Weight (kg) (with brake)	8.2	8.4	8.9	9.2	17.5	8.2	8.4	8.9
Max. radial shaft load (N)	490	490	490	490	1176	490	490	490
Max. thrust shaft load (N)	98	98	98	98	490	98	98	98
Power rating (kW/s) (with brake)	6.4	24.9	43.1	59.7	24.1	9.2	35.9	62.1
Rotor moment of inertia (Kg.m2) (with brake)	8.94E-4	9.14E-4	11.90E-4	15.88E-4	37.86E-4	8.94E-4	9.14E-4	11.9E-4
Mechanical time constant (ms) (with brake)	2.07	1.64	1.19	1.05	1.77	2.0	1.51	1.13
Brake holding torque [Nt-m (min)]	16.5	16.5	16.5	16.5	25	16.5	16.5	16.5
Brake power consumption (at 20 °C) [W]	21.0	21.0	21.0	21.0	31.1	21.0	21.0	21.0
Brake release time [ms (Max)]	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Brake pull-in time [ms (Max)]	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Vibration grade (um)	15							
Operating temperature	0 to 40°C(32 to 104°F)							
Storage temperature	-10 to 80°C(-14 to 176°F)							
Operating humidity	20~90%RH (non-condensing)							
Storage humidity	20~90%RH (non-condensing)							
Vibration capacity	2.5G							
IP rating	IP65 (using waterproof connectors and shaft seal installation (or using oil seal models))							
Approvals	CE cULus							

Speed-Torque Curves



ECMA-C30401☐S



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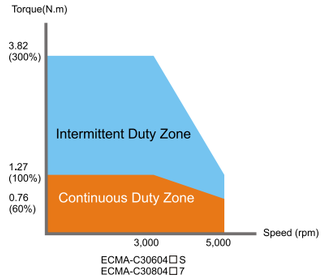
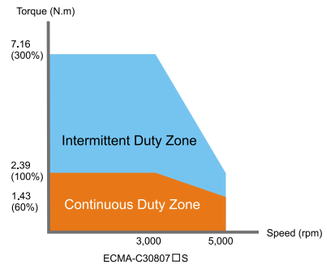
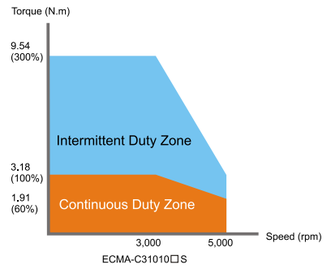


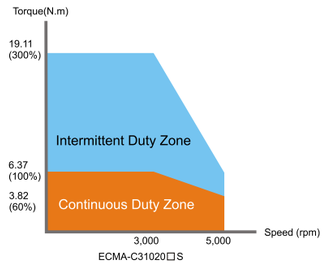
ECMA-C30604☐S
ECMA-C30804☐7



ECMA-C30807☐S



ECMA-C31010☐S



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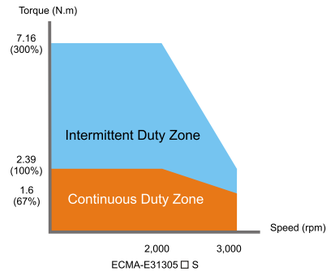
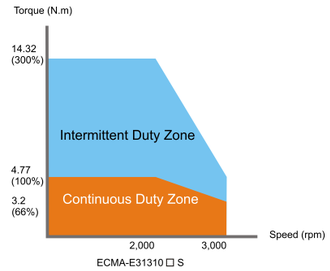
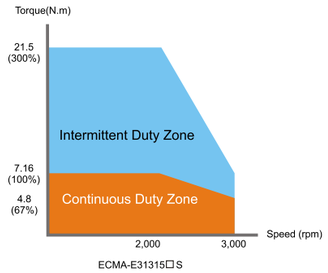


ECMA-E31305☐S



ECMA-E31310☐S



ECMA-E31315☐S

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ASDA-*A2* Series

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DELTA

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Product Line-up

220V Series

Servo Drives



100W	0.2kW	0.4kW	0.75kW	1.0kW	1.5kW	2kW	3kW
ASD-A2-0121-□	ASD-A2-0221-□	ASD-A2-0421-□	ASD-A2-0721-□	ASD-A2-1021-□	ASD-A2-1521-□	ASD-A2-2023-□	ASD-A2-3023-□

Servo Motors








ECMA-C△0401□S	ECMA-C△0602□S	ECMA-C△0604□S ECMA-C△0804□7 ECMA-E△1305□S ECMA-G△1303□S	ECMA-C△0807□S ECMA-G△1306□S ECMA-C△0907□S	ECMA-C△1010□S ECMA-E△1310□S ECMA-G△1309□S ECMA-C△0910□S ECMA-F△1308□S	ECMA-E△1315□S	ECMA-C△1020□S ECMA-E△1320□S ECMA-E△1820□S	ECMA-E△1830□S ECMA-F△1830□S ECMA-C△1330□4 ECMA-E△1835□S

		
4.5kW	5.5kW	7.5kW
ASD-A2-4523-□	ASD-A2-5523-□	ASD-A2-7523-□

		
ECMA-F△1845□S	ECMA-F△1855□3	ECMA-F△1875□3

1. The boxes (□) at the ends of the servo drive model names are for optional configurations. For the actual model name, please refer to the model explanation of the servo drive.
2. The boxes (□) in the servo motor model names are for optional configurations (keyway, brake and oil seal).
3. The boxes (△) in the model names are for encoder resolution types (△=1: Incremental encoder, 20-bit; △=2: Incremental encoder, 17-bit).

Product Line-up

220V Series

*ASDA-A2 220V Series 11kW and 15kW models will be available for ordering soon.

Servo Drives		
	11kW*	15kW*
	ASD-A2-1B23-□	ASD-A2-1F23-□

Servo Motors		
	ECMA-F1221B□3	ECMA-F1221F□S

1. The boxes (□) at the ends of the servo drive model names are for optional configurations. For the actual model name, please refer to the model explanation of the servo drive.
2. The boxes (□) in the servo motor model names are for optional configurations (keyway, brake and oil seal).
3. The boxes (△) in the model names are for encoder resolution types (△=1: Incremental encoder, 20-bit; △=2: Incremental encoder, 17-bit).

Product Line-up

400V Series

Servo Drives



750W	1000W	1500W	2000W	3000W	4500W	5500W	7.5kW
ASD-A2-0743-□	ASD-A2-1043-□	ASD-A2-1543-□	ASD-A2-2043-□	ASD-A2-3043-□	ASD-A2-4543-□	ASD-A2-5543-□	ASD-A2-7543-□

Servo Motors





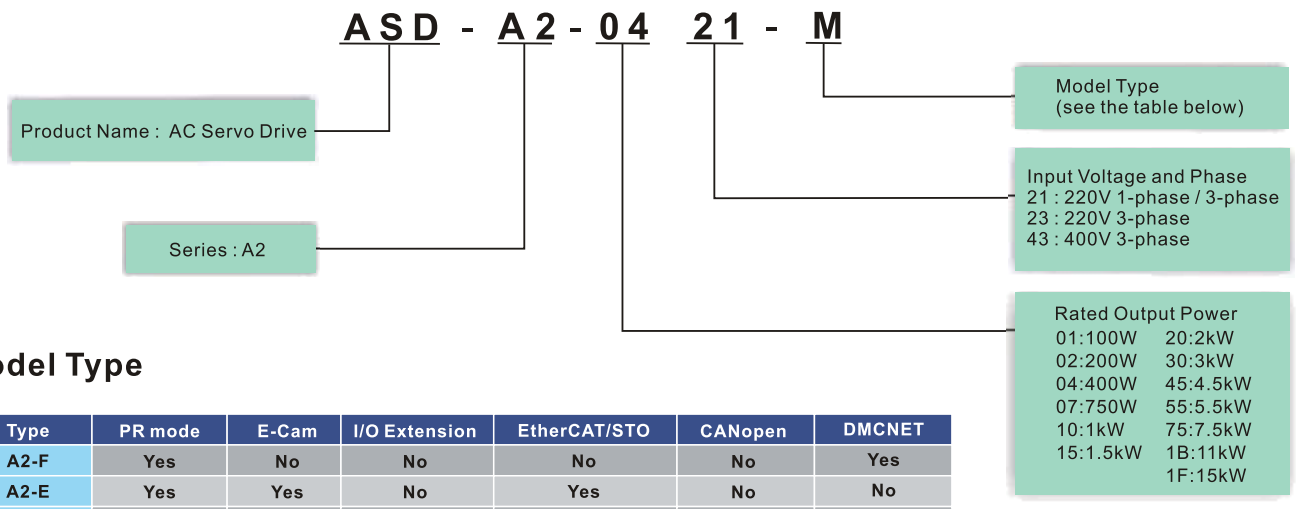



ECMA-J10807□S	ECMA-K11310□S ECMA-L11308□S	ECMA-K11315□S ECMA-J11010□S	ECMA-K11320□S ECMA-J11020□S ECMA-K11820□S	ECMA-L△1830□S ECMA-J11330□4	ECMA-L11845□S	ECMA-L11855□S	ECMA-L11875□3

1. The boxes (□) at the ends of the servo drive model names are for optional configurations. For the actual model name, please refer to the model explanation of the servo drive.
2. The boxes (□) in the servo motor model names are for optional configurations (keyway, brake and oil seal).
3. The boxes (△) in the model names are for encoder resolution types (△=1: Incremental encoder, 20-bit; △=2: Incremental encoder, 17-bit).

Model Explanation

ASDA-A2 Series Servo Drives



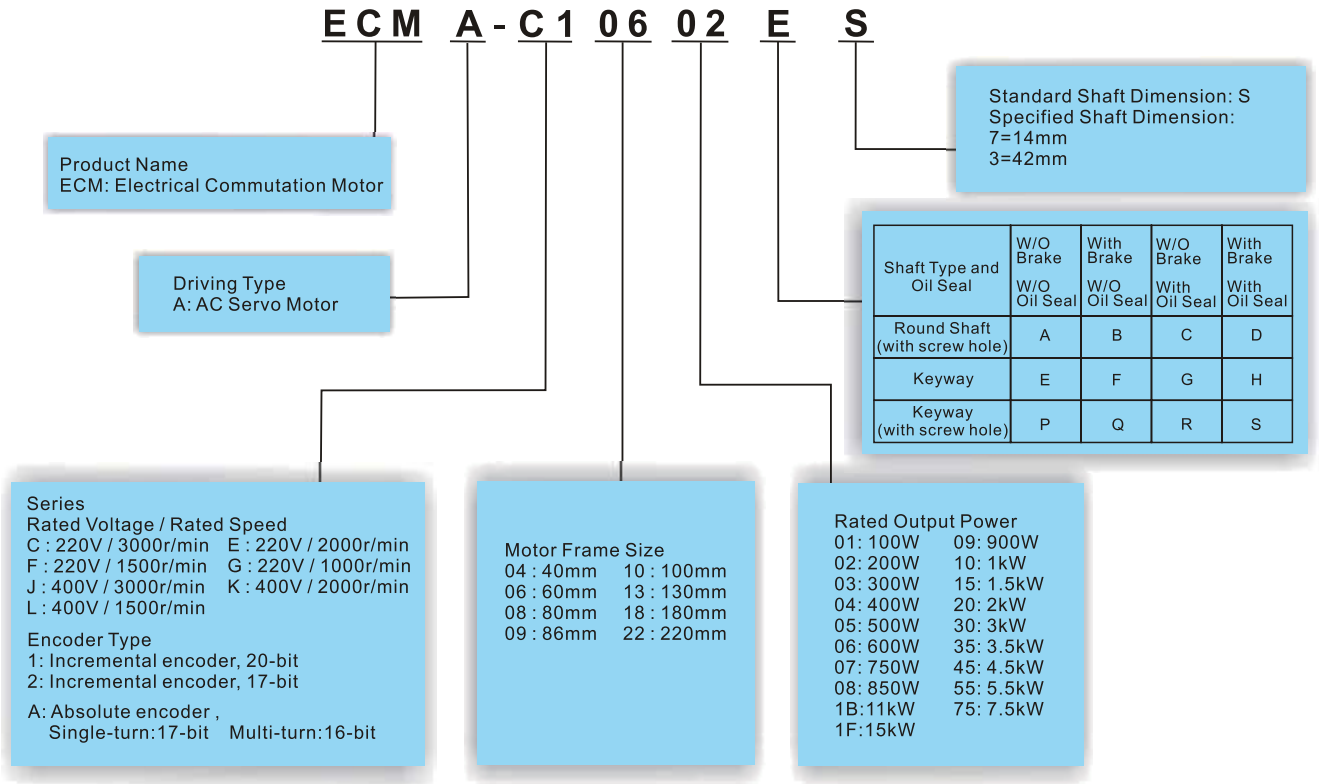
Model Type

Type	PR mode	E-Cam	I/O Extension	EtherCAT/STO	CANopen	DMCNET
A2-F	Yes	No	No	No	No	Yes
A2-E	Yes	Yes	No	Yes	No	No
A2-M	Yes	Yes	No	No	Yes	No
A2-U	Yes	Yes	Yes	No	No	No
A2-L	Yes	No	No	No	No	No

F: DMCNET
M: Support CANopen
E: Support EtherCAT

U: Without CANopen
L: Without E-Cam

ECMA Series Servo Motors



Servo Motor Specifications

- Low Inertia Series(Incremental)

220V Series

ECMA Series	C△04	C△06		C△08		C△09		C△10		C△13
	01	02	04	04	07	07	10	10	20	30
Rated output power (kW)	0.1	0.2	0.4	0.4	0.75	0.75	1.0	1.0	2.0	3.0
Rated torque (N-m)*1	0.32	0.64	1.27	1.27	2.39	2.39	3.18	3.18	6.37	9.55
Maximum torque (N-m)	0.96	1.92	3.82	3.82	7.16	7.14	8.78	9.54	19.11	28.65
Rated speed (r/min)	3000					3000		3000		3000
Maximum speed (r/min)	5000					3000		5000		4500
Rated current (A)	0.90	1.55	2.6	2.6	5.1	3.66	4.25	7.3	12.05	17.2
Maximum current (A)	2.70	4.65	7.8	7.24	15.3	11	12.37	21.9	36.15	47.5
Power rating (kW/s)	27.7	22.4	57.6	22.1	48.4	29.6	38.6	38.1	90.6	71.8
Rotor moment of inertia ($x10^{-4}$kg-m^2)	0.037	0.177	0.277	0.68	1.13	1.93	2.62	2.65	4.45	12.7
Mechanical time constant (ms)	0.75	0.80	0.53	0.73	0.62	1.72	1.20	0.74	0.61	1.11
Torque constant-KT (N-m/A)	0.36	0.41	0.49	0.49	0.47	0.65	0.75	0.44	0.53	0.557
Voltage constant-KE(mV/(r/min))	13.6	16	17.4	18.5	17.2	27.5	24.2	16.8	19.2	20.98
Armature resistance (Ohm)	9.30	2.79	1.55	0.93	0.42	1.34	0.897	0.20	0.13	0.0976
Armature inductance (mH)	24.0	12.07	6.71	7.39	3.53	7.55	5.7	1.81	1.50	1.21
Electrical time constant (ms)	2.58	4.3	4.3	7.96	8.36	5.66	6.35	9.3	11.4	12.4
Insulation class	Class A (UL), Class B (CE)									
Insulation resistance	100MΩ , DC 500V									
Insulation strength	AC 1500 V, 60 seconds									
Weight (kg) (without brake)	0.5	1.2	1.6	2.1	3.0	2.9	3.8	4.3	6.2	7.8
Weight (kg) (with brake)	0.8	1.5	2.0	2.9	3.8	3.69	5.5	4.7	7.2	9.2
Max. radial shaft load (N)	78.4	196	196	245	245	245	245	490	490	490
Max. thrust shaft load (N)	39.2	68	68	98	98	98	98	98	98	98
Power rating (kW/s) (with brake)	25.6	21.3	53.8	22.1	48.4	29.3	37.9	30.4	82	65.1
Rotor moment of inertia ($x10^{-4}$kg-m^2) (with brake)	0.04	0.192	0.30	0.73	1.18	1.95	2.67	3.33	4.95	14.0
Mechanical time constant (ms) (with brake)	0.81	0.85	0.57	0.78	0.65	1.74	1.22	0.93	0.66	1.22
Brake holding torque [Nt-m (min)]	0.3	1.3	1.3	2.5	2.5	2.5	2.5	8	8	10.0
Brake power consumption (at 20°C) [W]	7.2	6.5	6.5	8.2	8.2	8.2	8.2	18.5	18.5	19.0
Brake release time [ms (Max)]	5	10	10	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	25	70	70	70	70	70	70	70	70	70
Vibration grade (μm)	15									
Operating temperature (°C)	0°C to 40°C (32°F to 104°F)									
Storage temperature (°C)	-10°C to 80°C (-14°F to 176°F)									
Operating humidity	20 to 90%RH (non-condensing)									
Storage humidity	20 to 90%RH (non-condensing)									
Vibration capacity	2.5G									
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))									
Approvals	CE Mark Safety Approved; UL/cUL Safety Approved									

Footnote:
*1 Rate torque values are continuous permissible values at 0~40°C ambient temperature when attaching with the sizes of heatsinks listed below:
ECMA-__04 / 06 / 08 : 250mm x 250mm x 6mm
ECMA-__10 : 300mm x 300mm x 12mm
ECMA-__13 : 400mm x 400mm x 20mm
ECMA-__18 : 550mm x 550mm x 30mm
ECMA-__22 : 650mm x 650mm x 30mm
Material type : Aluminum F40, F60, F80, F100, F130, F180, F220
*2 The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.
*3 Please refer to page 13 for details about the model explanation.

Servo Motor Specifications

- Medium / High Inertia Series (Incremental)

220V Series

Model: ECMA Series	E△13			
	05	10	15	20
Rated output power (kW)	0.5	1.0	1.5	2.0
Rated torque (N-m)*1	2.39	4.77	7.16	9.55
Maximum torque (N-m)	7.16	14.32	21.48	28.65
Rated speed (r/min)	2000			
Maximum speed (r/min)	3000			
Rated current (A)	2.9	5.6	8.3	11.01
Maximum current (A)	8.7	16.8	24.81	33
Power rating (kW/s)	7.0	27.1	45.9	62.5
Rotor moment of inertia ($x10^{-4}$kg-m^2) (without brake)	8.17	8.41	11.18	14.59
Mechanical time constant (ms)	1.91	1.51	1.11	0.96
Torque constant-KT (N-m/A)	0.83	0.85	0.87	0.87
Voltage constant-KE (mV/(r/min))	30.9	31.9	31.8	31.8
Armature resistance (Ohm)	0.57	0.47	0.26	0.174
Armature inductance (mH)	7.39	5.99	4.01	2.76
Electrical time constant (ms)	12.96	12.88	15.31	15.86
Insulation class	Class A (UL), Class B (CE)			
Insulation resistance	100MΩ , DC 500V			
Insulation strength	AC 1500 V, 60 seconds			
Weight (kg) (without brake)	6.8	7	7.5	7.8
Weight (kg) (with brake)	8.2	8.4	8.9	9.2
Max. radial shaft load (N)	490	490	490	490
Max. thrust shaft load (N)	98	98	98	98
Power rating (kW/s) (with brake)	6.4	24.9	43.1	59.7
Rotor moment of inertia ($x10^{-4}$kg-m^2) (with brake)	8.94	9.14	11.90	15.88
Mechanical time constant (ms) (with brake)	2.07	1.64	1.19	1.05
Brake holding torque [Nt-m (min)]	10.0	10.0	10.0	10.0
Brake power consumption (at 20°C) [W]	19.0	19.0	19.0	19.0
Brake release time [ms (Max)]	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70
Vibration grade (μm)	15			
Operating temperature (°C)	0°C to 40°C (32°F to 104°F)			
Storage temperature (°C)	-10°C to 80°C (-14°F to 176°F)			
Operating humidity	20 to 90%RH (non-condensing)			
Storage humidity	20 to 90%RH (non-condensing)			
Vibration capacity	2.5G			
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))			
Approvals	CE Mark Safety Approved; UL/cUL Safety Approved			

Footnote:
*1 Rate torque values are continuous permissible values at 0~40°C ambient temperature when attaching with the sizes of heatsinks listed below:
ECMA-__04 / 06 / 08 : 250mm x 250mm x 6mm
ECMA-__10 : 300mm x 300mm x 12mm
ECMA-__13 : 400mm x 400mm x 20mm
ECMA-__18 : 550mm x 550mm x 30mm
ECMA-__22 : 650mm x 650mm x 30mm
Material type : Aluminum F40, F60, F80, F100, F130, F180, F220
*2 The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.
*3 Please refer to page 13 for details about the model explanation.

Servo Motor Specifications

- Medium / High Inertia Series (Incremental)

220V Series

Model: ECMA Series	E△18			G△13		
	20	30	35	03	06	09
Rated output power (kW)	2.0	3.0	3.5	0.3	0.6	0.9
Rated torque (N-m)*1	9.55	14.32	16.71	2.86	5.73	8.59
Maximum torque (N-m)	28.65	42.97	50.13	8.59	17.19	21.48
Rated speed (r/min)	2000			1000		
Maximum speed (r/min)	3000			2000		
Rated current (A)	11.22	16.1	19.2	2.5	4.8	7.5
Maximum current (A)	33.66	48.3	57.6	7.44	14.49	22.5
Power rating (kW/s)	26.3	37.3	50.8	10.0	39.0	66.0
Rotor moment of inertia ($x10^{-4}$kg-m^2) (without brake)	34.68	54.95	54.95	8.17	8.41	11.18
Mechanical time constant (ms)	1.62	1.06	1.08	1.84	1.40	1.07
Torque constant-KT (N-m/A)	0.85	0.89	0.87	1.15	1.19	1.15
Voltage constant-KE (mV/(r/min))	31.4	32	32	42.5	43.8	41.6
Armature resistance (Ohm)	0.119	0.052	0.052	1.06	0.82	0.43
Armature inductance (mH)	2.84	1.38	1.38	14.29	11.12	6.97
Electrical time constant (ms)	23.87	26.39	26.39	13.55	13.55	16.06
Insulation class	Class A (UL), Class B (CE)					
Insulation resistance	100MΩ , DC 500V					
Insulation strength	AC 1500 V, 60 seconds					
Weight (kg) (without brake)	13.5	18.5	18.5	6.8	7	7.5
Weight (kg) (with brake)	17.5	22.5	22.5	8.2	8.4	8.9
Max. radial shaft load (N)	1176	1470	490	490	490	490
Max. thrust shaft load (N)	490	490	98	98	98	98
Power rating (kW/s) (with brake)	24.1	35.9	48.9	9.2	35.9	62.1
Rotor moment of inertia ($x10^{-4}$kg-m^2) (with brake)	37.86	57.06	57.06	8.94	9.14	11.9
Mechanical time constant (ms) (with brake)	1.77	1.10	1.12	2.0	1.51	1.13
Brake holding torque [Nt-m (min)]	25.0	25.0	10.0	10.0	10.0	10.0
Brake power consumption (at 20°C) [W]	20.4	20.4	19.0	19.0	19.0	19.0
Brake release time [ms (Max)]	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70	70
Vibration grade (μm)	15					
Operating temperature (°C)	0°C to 40°C (32°F to 104°F)					
Storage temperature (°C)	-10°C to 80°C (-14°F to 176°F)					
Operating humidity	20 to 90%RH (non-condensing)					
Storage humidity	20 to 90%RH (non-condensing)					
Vibration capacity	2.5G					
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))					
Approvals	CE Mark Safety Approved; UL/cUL Safety Approved					

Footnote:
*1 Rate torque values are continuous permissible values at 0~40°C ambient temperature when attaching with the sizes of heatsinks listed below:
ECMA-__04 / 06 / 08 : 250mm x 250mm x 6mm
ECMA-__10 : 300mm x 300mm x 12mm
ECMA-__13 : 400mm x 400mm x 20mm
ECMA-__18 : 550mm x 550mm x 30mm
ECMA-__22 : 650mm x 650mm x 30mm
Material type : Aluminum F40, F60, F80, F100, F130, F180, F220
*2 The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.
*3 Please refer to page 13 for details about the model explanation.

Servo Motor Specifications

- Medium / Medium-High Inertia Series (Incremental)

220V Series

Model: ECMA Series	F△13	F△18				F△22	
	08	30	45	55	75	1B	1F
Rated output power (kW)	0.85	3.0	4.5	5.5	7.5	11	15
Rated torque (N-m)*1	5.41	19.10	28.65	35.01	47.74	70	95.4
Maximum torque (N-m)	13.8	57.29	71.62	87.53	119.36	175	224.0
Rated speed (r/min)	1500						
Maximum speed (r/min)	3000					2000	
Rated current (A)	7.4	19.4	32.5	40.0	47.5	51.8	61.5
Maximum current (A)	18.6	58.2	81.3	100.0	118.8	129.5	145.7
Power rating (kW/s)	20.8	66.4	105.5	122.9	159.7	148.9	164.6
Rotor moment of inertia ($x10^{-4}$kg-m^2) (without brake)	14.1	54.95	77.75	99.78	142.7	329	553
Mechanical time constant (ms)	2.73	1.28	0.92	0.96	0.63	1.36	1.23
Torque constant-KT (N-m/A)	0.73	0.98	0.88	0.88	1.01	1.35	1.55
Voltage constant-KE (mV/(r/min))	28.0	35.0	32.0	31.0	35.5	49	55.65
Armature resistance (Ohm)	0.38	0.077	0.032	0.025	0.015	0.026	0.018
Armature inductance (mH)	5.2	1.27	0.89	0.60	0.40	0.64	0.45
Electrical time constant (ms)	13.7	16.5	27.8	24.0	26.7	24.77	24.51
Insulation class	Class A (UL), Class B (CE)						
Insulation resistance	100MΩ , DC 500V						
Insulation strength	AC 1500 V, 60 seconds						
Weight (kg) (without brake)	8.6	18.5	23.5	30.5	37.0	56.4	86.4
Weight (kg) (with brake)	10.0	22.5	29	36	46	-	-
Max. radial shaft load (N)	490	1470	1470	1764	1764	3300	3300
Max. thrust shaft load (N)	98	490	490	588	588	1100	1100
Power rating (kW/s) (with brake)	19.3	63.9	101.8	119.4	156.6	-	-
Rotor moment of inertia ($x10^{-4}$kg-m^2) (with brake)	15.2	57.06	80.65	102.70	145.55	-	-
Mechanical time constant (ms) (with brake)	2.73	1.33	0.96	0.99	0.64	-	-
Brake holding torque [Nt-m (min)]	10.0	25.0	25.0	25.0	25.0	115	115
Brake power consumption (at 20°C) [W]	19.0	20.4	20.4	20.4	20.4	28.8	28.8
Brake release time [ms (Max)]	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70	70	70
Vibration grade (μm)	15						
Operating temperature (°C)	0°C to 40°C (32°F to 104°F)						
Storage temperature (°C)	-10°C to 80°C (-14°F to 176°F)						
Operating humidity	20 to 90%RH (non-condensing)						
Storage humidity	20 to 90%RH (non-condensing)						
Vibration capacity	2.5G						
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))						
Approvals	CE Mark Safety Approved; UL/cUL Safety Approved						

Footnote:
*1 Rate torque values are continuous permissible values at 0~40°C ambient temperature when attaching with the sizes of heatsinks listed below:
ECMA-__04 / 06 / 08 : 250mm x 250mm x 6mm
ECMA-__10 : 300mm x 300mm x 12mm
ECMA-__13 : 400mm x 400mm x 20mm
ECMA-__18 : 550mm x 550mm x 30mm
ECMA-__22 : 650mm x 650mm x 30mm
Material type : Aluminum F40, F60, F80, F100, F130, F180, F220
*2 The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.
*3 To reach the motor's max. torque limit of 250%, use the servo drive with higher watts.
*4 The application of UL safety compliance for ECMA-F11305, ECMA-F11308, ECMA-F11313, ECMA-F11318 is in process.

Servo Motor Specifications

- Medium / Low Inertia Series (Incremental)

400V Series

Model: ECMA Series	J108	J110		J113	K113			K118
	07	10	20	30	10	15	20	20
Rated output power (kW)	0.75	1.0	2.0	3.0	1.0	1.5	2.0	2.0
Rated torque (N-m)*1	2.39	3.18	6.37	9.55	4.77	7.16	9.55	9.55
Maximum torque (N-m)	7.16	9.54	19.1	28.65	14.32	21.48	28.65	28.65
Rated speed (r/min)	3000			3000	2000			
Maximum speed (r/min)	5000			4500	3000			
Rated current (A)	3.07	4.15	7.09	9.8	3.52	5.02	6.66	6.66
Maximum current (A)	9.5	12.46	21.28	29.99	10.56	15.06	19.98	19.98
Power rating (kW/s)	50.4	38.2	91.2	71.8	27.1	45.9	62.5	26.3
Rotor moment of inertia ($x10^{-4}$kg-m^2) (without brake)	1.13	2.65	4.45	12.7	8.41	11.18	14.59	34.68
Mechanical time constant (ms)	0.66	0.77	0.58	0.99	1.80	1.24	1.04	1.74
Torque constant-KT (N-m/A)	0.78	0.77	0.9	0.97	1.35	1.43	1.43	1.45
Voltage constant-KE (mV/(r/min))	28.24	29.0	34.4	37.3	53.2	55	55	54
Armature resistance (Ohm)	1.22	0.617	0.388	0.269	1.47	0.83	0.57	0.376
Armature inductance (mH)	10.68	6.03	4.62	3.55	17.79	11.67	8.29	7.87
Electrical time constant (ms)	8.75	9.77	11.9	13.2	12.04	14.04	14.39	20.9
Insulation class	Class A (UL) , Class B (CE)							
Insulation resistance	100MΩ , DC 500V							
Insulation strength	AC 1800 V, 60 seconds							
Weight (kg) (without brake)	3.0	4.3	6.2	7.8	7.0	7.5	7.8	13.5
Weight (kg) (with brake)	3.8	4.7	7.2	9.2	8.4	8.9	9.2	17.5
Max. radial shaft load (N)	245	490	490	490	490	490	490	1176
Max. thrust shaft load (N)	98	98	98	98	98	98	98	490
Power rating (kW/s) (with brake)	48.4	30.4	82	65.1	24.9	43.1	59.7	24.1
Rotor moment of inertia ($x10^{-4}$kg-m^2) (with brake)	1.18	3.33	4.95	14.0	9.14	11.90	15.88	37.86
Mechanical time constant (ms) (with brake)	0.65	0.96	0.65	1.09	1.96	1.32	1.13	1.9
Brake holding torque [Nt-m (min)]	2.5	8	8	10.0	10.0	10.0	10.0	25.0
Brake power consumption (at 20°C) [W]	8.5	18.5	18.5	19.0	19.0	19.0	19.0	20.4
Brake release time [ms (Max)]	10	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70	70	70	70
Vibration grade (μm)	15							
Operating temperature (°C)	0°C to 40°C (32°F to 104°F)							
Storage temperature (°C)	-10°C to 80°C (-14°F to 176°F)							
Operating humidity	20 to 90%RH (non-condensing)							
Storage humidity	20 to 90%RH (non-condensing)							
Vibration capacity	2.5G							
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))							
Approvals	CE Mark Safety Approved; UL/cUL Safety Approved							

Footnote:
*1 Rate torque values are continuous permissible values at 0~40°C ambient temperature when attaching with the sizes of heatsinks listed below:
ECMA-__04 / 06 / 08 : 250mm x 250mm x 6mm
ECMA-__10 : 300mm x 300mm x 12mm
ECMA-__13 : 400mm x 400mm x 20mm
ECMA-__18 : 550mm x 550mm x 30mm
ECMA-__22 : 650mm x 650mm x 30mm
Material type : Aluminum F40, F60, F80, F100, F130, F180, F220
*2 The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.
*3 Please refer to page 13 for details about the model explanation.

Servo Motor Specifications

- Medium / High Inertia Series (Incremental)

400V Series

Model: ECMA Series	L118				L113
	30	45	55	75	08
Rated output power (kW)	3.0	4.5	5.5	7.5	0.85
Rated torque (N-m)*1	19.10	28.65	35.01	47.74	5.39
Maximum torque (N-m)	57.29	71.62	87.53	119.36	13.8
Rated speed (r/min)	1500				
Maximum speed (r/min)	3000				2000
Rated current (A)	11.53	20.8	22.37	27.3	35.7
Maximum current (A)	34.6	52	56	68.3	9.5
Power rating (kW/s)	66.4	105.5	122.9	159.7	17.0
Rotor moment of inertia ($x10^{-4}$kg-m^2) (without brake)	54.95	77.75	99.78	142.7	17.1
Mechanical time constant (ms)	1.11	0.94	0.88	0.77	1.91
Torque constant-KT (N-m/A)	1.66	1.38	1.56	1.75	1.51
Voltage constant-KE (mV/(r/min))	64.4	53	58.9	66.4	56.9
Armature resistance (Ohm)	0.21	0.09	0.07	0.06	0.914
Armature inductance (mH)	4.94	2.36	2.2	1.7	13.7
Electrical time constant (ms)	23.97	28.07	27.6	28.29	15.0
Insulation class	-----				Class A (UL), Class B (CE)
Insulation resistance	100MΩ , DC 500V				
Insulation strength	AC 1800 V, 50Hz, 60 seconds				AC 1500 V, 50Hz, 60 seconds
Weight (kg) (without brake)	18.5	23.5	30.5	37.0	8.6
Weight (kg) (with brake)	22.5	29	36	46	10
Max. radial shaft load (N)	1470	1470	1764	1764	490
Max. thrust shaft load (N)	490	490	588	588	98
Power rating (kW/s) (with brake)	63.9	101.8	119.4	156.6	15.0
Rotor moment of inertia ($x10^{-4}$kg-m^2) (with brake)	57.06	80.65	102.70	145.55	19.4
Mechanical time constant (ms) (with brake)	1.33	0.96	0.99	0.64	2.16
Brake holding torque [Nt-m (min)]	25.0	25.0	25.0	25.0	10.0
Brake power consumption (at 20°C) [W]	20.4	20.4	20.4	20.4	19.0
Brake release time [ms (Max)]	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70
Vibration grade (μm)	15				
Operating temperature (°C)	0°C to 40°C (32°F to 104°F)				
Storage temperature (°C)	-10°C to 80°C (-14°F to 176°F)				
Operating humidity	20 to 90%RH (non-condensing)				
Storage humidity	20 to 90%RH (non-condensing)				
Vibration capacity	2.5G				
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))				
Approvals	CE Mark Safety Approved; UL/cUL Safety Approved				

Footnote:
*1 Rate torque values are continuous permissible values at 0~40°C ambient temperature when attaching with the sizes of heatsinks listed below:
ECMA-__04 / 06 / 08 : 250mm x 250mm x 6mm
ECMA-__10 : 300mm x 300mm x 12mm
ECMA-__13 : 400mm x 400mm x 20mm
ECMA-__18 : 550mm x 550mm x 30mm
ECMA-__22 : 650mm x 650mm x 30mm
Material type : Aluminum F40, F60, F80, F100, F130, F180, F220
*2 The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.
*3 The application of UL safety compliance for ECMA-L11308 is in process.

Servo Drive Specifications

220V Series

Model: ASDA-A2 Series			100W	200W	400W	750W	1kW	2kW	1.5kW	3kW	4.5kW	5.5kW	7.5kW	11kW	15kW
			01	02	04	07	10	20	15	30	45	55	75	1B	1F
Power supply	Phase / Voltage		Three-phase / Single-phase 220VAC						Three-phase 220VAC						
	Permissible Voltage Range		Three-phase / Single-phase 200~230VAC，-15%~10%						Three-phase 200~230VAC，-15%~10%						
	Continuous Output Current		0.9 Arms	1.55 Arms	2.6 Arms	5.1 Arms	7.3 Arms	8.3 Arms	13.4 Arms	19.4 Arms	32.5 Arms	40 Arms	47.5 Arms	54.4 Arms	70 Arms
Cooling System			Natural Air Circulation			Fan Cooling									
Encoder Resolution / Feedback Resolution			Incremental：20-bit (1280000 p/rev)；Absolute：17-bit												
Control of Main Circuit			SVPWM(Space Vector Pulse Width Modulation) Control												
Tuning Modes			Auto / Manual												
Dynamic Brake			None			Built-in						External			
Position Control Mode	Max. Input Pulse Frequency (Only for Non-DMCNET mode)		Max. 500Kpps / 4Mpps (Line driver), Max. 200Kpps (Open collector)												
	Pulse Type (Only for Non-DMCNET mode)		Pulse + Direction, A phase + B phase, CCW pulse + CW pulse												
	Command Source		External pulse train (PT mode) (Only for Non-DMCNET mode) / Internal parameters (PR mode)												
	Smoothing Strategy		Low-pass and P-curve filter												
	Electronic Gear		Electronic gear N/M multiple N: 1~32767, M: 1:32767 (1/50<N/M<25600)												
	Torque Limit Operation		Set by parameters												
	Feed Forward Compensation		Set by parameters												
	Analog Input Command (Only for Non-DMCNET mode)	Voltage Range	0~±10 VDC												
		Input Resistance	10K Ω												
		Time Constant	2.2 μs												
Speed Control Mode	Speed Control Range *1		1:5000									1:3000		1:2000	
	Command Source		External analog signal (Only for Non-DMCNET mode) / Internal parameters												
	Smoothing Strategy		Low-pass and S-curve filter												
	Torque Limit Operation		Set by parameters or via analog input (Only for Non-DMCNET mode)												
	Frequency Response Characteristic		Maximum 1kHz												
	Speed Accuracy *2 (at rated rotation speed)		0.01% or less at 0 to 100% load fluctuation												
			0.01% or less at ±10% power fluctuation												
			0.01% or less at 0℃ to 50℃ ambient temperature fluctuation												
Torque Control Mode	Analog Input Command (Only for Non-DMCNET mode)	Voltage Range	0~±10 VDC												
		Input Resistance	10KΩ												
		Time Constant	2.2 μs												
	Command Source		External analog signal (Only for Non-DMCNET mode) / Internal parameters												
	Smoothing Strategy		Low-pass filter												
	Speed Limit Operation		Set by parameters or via analog input (Only for Non-DMCNET mode)												
Analog Monitor Output			Monitor signal can set by parameters (Output voltage range: ±8V)												
Digital Inputs/Outputs		Inputs	Servo on, Reset, Gain switching, Pulse clear, Zero speed CLAMP, Command input reverse control, Command triggered, Speed/Torque limit enabled, Position command selection, Motor stop, Speed position selection, Position / Speed mode switching, Speed / Torque mode switching, Torque / Position mode switching, PT / PR command switching, Emergency stop, Forward / Reverse inhibit limit, Reference “Home” sensor, Forward / Reverse operation torque limit, Move to “Home”, Electronic Cam (E-Cam), Forward / Reverse JOG input, Event trigger PR command, Electronic gear ratio (Numerator) selection and Pulse inhibit input * Please note that the above digital signals and inputs are available only for Non-DMCNET mode. In DMCNET mode, it is recommended to write digital inputs into the servo drives through DMCNET communication, and the digital inputs should be used for Emergency Stop, Forward / Reverse Inhibit limit and Reference "Home" sensor only.												
		Outputs	Encoder signal output (A, B, Z Line Driver and Z Open Collector) Servo ready, Servo on, At Zero speed, At Speed reached, At Positioning completed, At Torques limit, Servo alarm (Servo fault) activated, Electromagnetic brake control, Homing completed, Output overload warning, Servo warning activated, Position command overflow, Forward / Reverse software limit, Internal position command completed, Capture operation completed output., Motion control completed output., Master position of E-Cam (Electronic Cam)												
Protective Functions			Overcurrent, Overvoltage, Undervoltage, Motor overheated, Regeneration error, Overload, Overspeed, Abnormal pulse control command, Excessive deviation, Encoder error, Adjustment error, Emergency stop activated, Reverse/ Forward limit switch error, Position excessive deviation of full-close control loop, Serial communication error, Input power phase loss, Serial communication time out, short circuit protection of U, V, W, and CN1, CN2, CN3 terminals												
Communication Interface			RS-232／RS-485／CANopen／USB／DMCNET												
Environment		Installation Site	ndoor location (free from direct sunlight), no corrosive liquid and gas (far away from oil mist, flammable gas, dust)												
		Altitude	Altitude 1000m or lower above sea level												
		Atmospheric Pressure	86kPa～106kPa												
		Operating Temperature	0°C ~ 55°C (If operating temperature is above 45 °C, forced cooling will be required)												
		Storage Temperature	-20℃ ～65℃												
		Humidity	0~90% RH (non-condensing)												
		Vibration	9.80665m/s^2(1G) less than 20Hz, 5.88m/ s^2(0.6G) 20 to 50Hz												
		IP Rating	IP20												
		Power System	TN System*3												
		Approvals	CE, UL/cUL Safety Approved, RCM, IEC / EN 61800-5-1, UL508C												

Footnote: ***1** Rated rotation speed: When full load, speed ratio is defined as the minimum speed (the motor will not pause).
***2** When command is rated rotation speed, the speed fluctuation rate is defined as: (Empty load rotation speed Full load rotation speed) / Rated rotation speed
***3** TN system: A power distribution system having one point directly earthed, the exposed conductive parts of the installation being connected to that points by protective earth conductor.

400V Series

Model: ASDA-A2 Series			750W	1kW	1.5kW	2kW	3kW	4.5kW	5.5kW	7.5kW
			07	10	15	20	30	45	55	75
Control Power	Input Voltage		24VDC ‧ ±10%							
	Input Current		0.89A			1.18A				1.66A
	Input Power		21.4W			28.2W				39.85W
Permissible Voltage Range			Three-phase 380~480VAC ‧ ±10%							
Continuous Output Current			3.07 Arms	3.52 Arms	5.02 Arms	6.66 Arms	11.9 Arms	20 Arms	22.37 Arms	30 Arms
Cooling System			Fan Cooling							
Encoder Resolution / Feedback Resolution			Incremental：20-bit (1280000 p/rev)；Absolute：17-bit							
Control of Main Circuit			SVPWM (Space Vector Pulse Width Modulation) Control							
Tuning Modes			Auto / Manual							
Dynamic Brake			Built-in			External				
Position Control Mode	Max. Input Pulse Frequency (Only for Non-DMCNET mode)		Max. 500Kpps / 4Mpps (Line driver), Max. 200Kpps (Open collector)							
	Pulse Type (Only for Non-DMCNET mode)		Pulse + Direction, A phase + B phase, CCW pulse + CW pulse							
	Command Source		External pulse train (PT mode) (Only for Non-DMCNET mode) / Internal parameters (PR mode)							
	Smoothing Strategy		Low-pass and P-curve filter							
	Electronic Gear		Electronic gear N/M multiple N: 1~32767, M: 1:32767 (1/50<N/M<25600)							
	Torque Limit Operation		Set by parameters							
	Feed Forward Compensation		Set by parameters							
Speed Control Mode	Analog Input Command (Only for Non-DMCNET mode)	Voltage Range	0~±10 VDC							
		Input Resistance	10K Ω							
		Time Constant	2.2 μs							
	Speed Control Range *1		1:5000					1:3000		
	Command Source		External analog signal (Only for Non-DMCNET mode) / Internal parameters							
	Smoothing Strategy		Low-pass and S-curve filter							
	Torque Limit Operation		Set by parameters or via analog input (Only for Non-DMCNET mode)							
	Frequency Response Characteristic		Maximum 1kHz							
	Speed Accuracy *2 (at rated rotation speed)		0.01% or less at 0 to 100% load fluctuation							
			0.01% or less at ±10% power fluctuation							
			0.01% or less at 0 oC to 50 oC ambient temperature fluctuation							
Torque Control Mode	Analog Input Command (Only for Non-DMCNET mode)	Voltage Range	0~±10 VDC							
		Input Resistance	10KΩ							
		Time Constant	2.2 μs							
	Command Source		External analog signal (Only for Non-DMCNET mode) / Internal parameters							
	Smoothing Strategy		Low-pass filter							
	Speed Limit Operation		Set by parameters or via analog input (Only for Non-DMCNET mode)							
Analog Monitor Output			Monitor signal can set by parameters (Output voltage range: ±8V)							
Digital Inputs/Outputs		Inputs	Servo on, Reset, Gain switching, Pulse clear, Zero speed CLAMP, Command input reverse control, Command triggered, Speed/Torque limit enabled, Position command selection, Motor stop, Speed position selection, Position / Speed mode switching, Speed / Torque mode switching, Torque / Position mode switching, PT / PR command switching, Emergency stop, Forward / Reverse inhibit limit, Reference “Home” sensor, Forward / Reverse operation torque limit, Move to “Home”, Electronic cam, Forward / Reverse JOG input, Event trigger PR command, Electronic gear ratio (Numerator) selection and Pulse inhibit input * Please note that the above digital signals and inputs are available only for Non-DMCNET mode. In DMCNET mode, it is recommended to write digital inputs into the servo drives through DMCNET communication, and the digital inputs should be used for Emergency Stop, Forward / Reverse Inhibit limit and Reference "Home" sensor only.							
		Outputs	Encoder signal output (A, B, Z Line Driver and Z Open Collector) Servo ready, Servo on, At Zero speed, At Speed reached, At Positioning completed, At Torques limit, Servo alarm (Servo fault) activated, Electromagnetic brake control, Homing completed, Output overload warning, Servo warning activated, Position command overflow, Forward / Reverse software limit, Internal position command completed, Capture operation completed output., Motion control completed output., Master position of E-Cam (Electronic Cam)							
Protective Functions			Overcurrent, Overvoltage, Undervoltage, Motor overheated, Regeneration error, Overload, Overspeed, Abnormal pulse control command, Excessive deviation, Encoder error, Adjustment error, Emergency stop activated, Reverse/ Forward limit switch error, Position excessive deviation of full-close control loop, Serial communication error, Input power phase loss, Serial communication time out, short circuit protection of U, V, W, and CN1, CN2, CN3 terminals							
Communication Interface			RS-232／RS-485／CANopen／USB／DMCNET							
Environment		Installation Site	Indoor location (free from direct sunlight), no corrosive liquid and gas (far away from oil mist, flammable gas, dust)							
		Altitude	Altitude 1000m or lower above sea level							
		Atmospheric Pressure	86kPa~106kPa							
		Operating Temperature	0°C ~ 55 °C (If operating temperature is above 45 °C, forced cooling will be required)							
		Storage Temperature	-20℃ ~65℃							
		Humidity	0~90% RH (non-condensing)							
		Vibration	9.80665m/s^2 (1G) less than 20Hz, 5.88m/ s^2 (0.6G) 20 to 50Hz							
		IP Rating	IP20							
		Power System	TN System *3							
		Approvals	CE UL/cUL Safety Approved IEC / EN 61800-5-1, UL508C							

Footnote: ***1** Rated rotation speed: When full load, speed ratio is defined as the minimum speed (the motor will not pause).
***2** When command is rated rotation speed, the speed fluctuation rate is defined as: (Empty load rotation speed Full load rotation speed) / Rated rotation speed
***3** TN system: A power distribution system having one point directly earthed, the exposed conductive parts of the installation being connected to that points by protective earth conductor.