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\*We reserve the right to change the information in this catalogue without prior notice.

# ASDA-A2

**DELTA ASDA-A2 AC Servo System**



ASDA-A2

# Introduction of *ASDA-A2* Series

# ASDA-A2

## Rapid, Stable, Precise More Rapid, More Stable, More Precise

**Delta Electronics, Inc.**, a leading manufacturer of industrial automation products, is pleased to announce that the new high-performance motion control ASDA-A2 series servo motors and servo drives has launched into the market.

The current trend of motion control is to have the control command source close to the drive. To catch this trend, Delta developed the new ASDA-A2 series, offering excellent motion control function so that the external controller could be almost eliminated. ASDA-A2 series features a built-in electronic cam (E-CAM) function which is the best solution for flying shear, rotary cutoff and synchronized motion applications. The whole new position control Pr mode is a unique and most significant function that provides a variety of control modes and definitely enhances system performance. The advanced CANopen interface for high-speed communication enables the drive to integrate with other parts of the automation more efficiently and effectively. The full closed-loop control, auto notch filter, vibration suppression and gantry control functions help to perform complex motions that require high precision and smooth operation. The 20-bit superior resolution encoder which is essential for accurate positioning applications is equipped as standard. In addition, the outstanding CAPTURE and COMPARE functions for high-speed pulses offer the best support for stepless positioning. Other additional functionality, such as up to 1kHz frequency response, innovative editing software and the high-speed PC monitoring function (similar to a digital oscilloscope), etc. all drastically maximize the performance of ASDA-A2 series.

*Delta's new ASDA-A2 series is the ultimate servo system providing a total solution for a wide range of machine tools and industrial applications.*

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# ASDA-A2 AC Servo System

# ASDA-A2

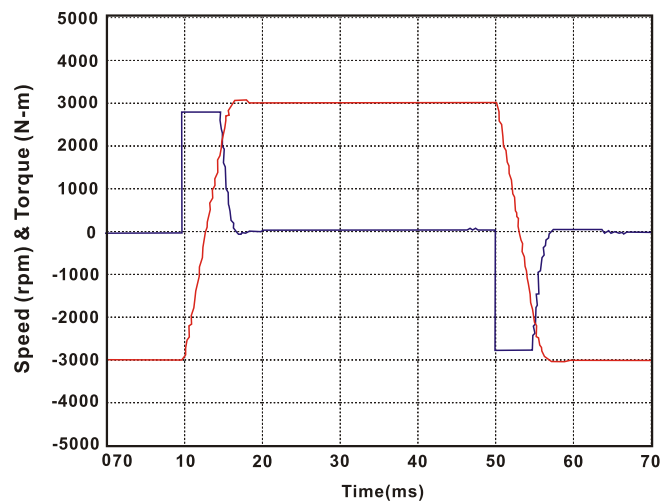
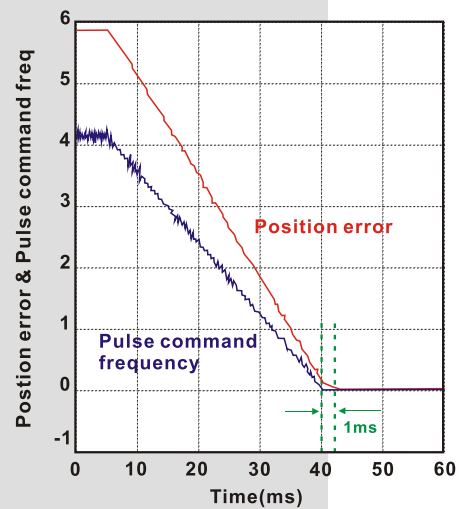
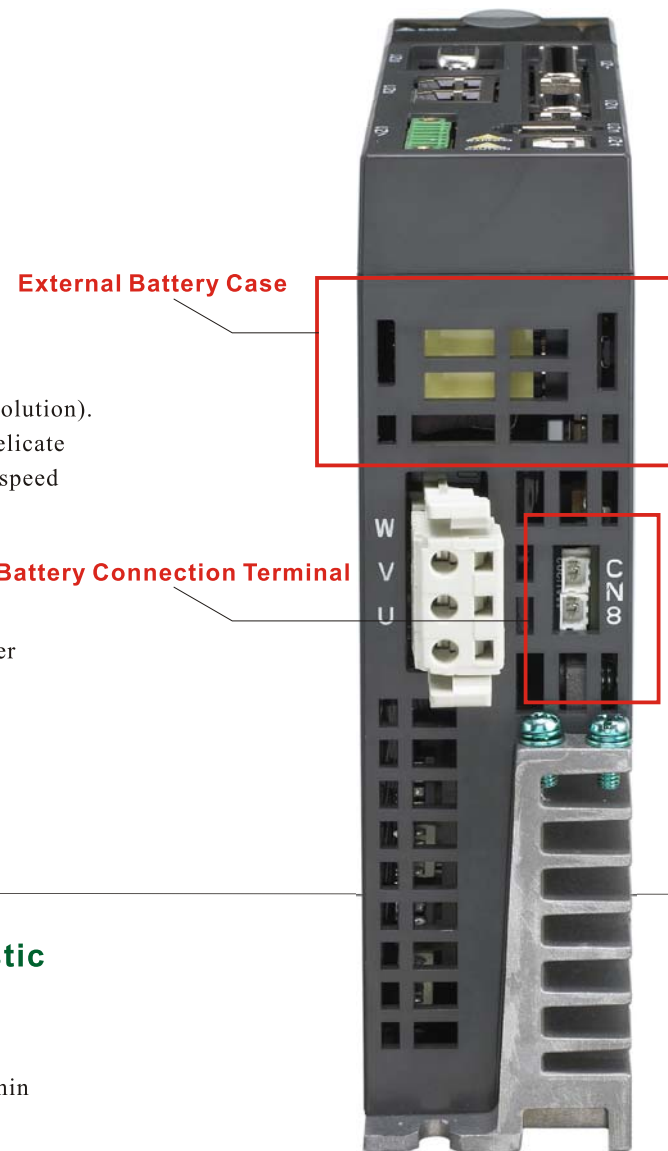
## Features

### High Precision Control

- ECMA series servo motors feature incremental encoder with 20-bit resolution (1280000 pulses/revolution). Existing functions to meet the requirements from delicate process have been enhanced. Stable rotation at low speed has also been achieved.
- Absolute type encoder is supported. Homing position will not get lost when power is cut off. (External battery case for absolute encoder is easy to install and use.)
- The external battery power is 4.5V<sub>DC</sub>.

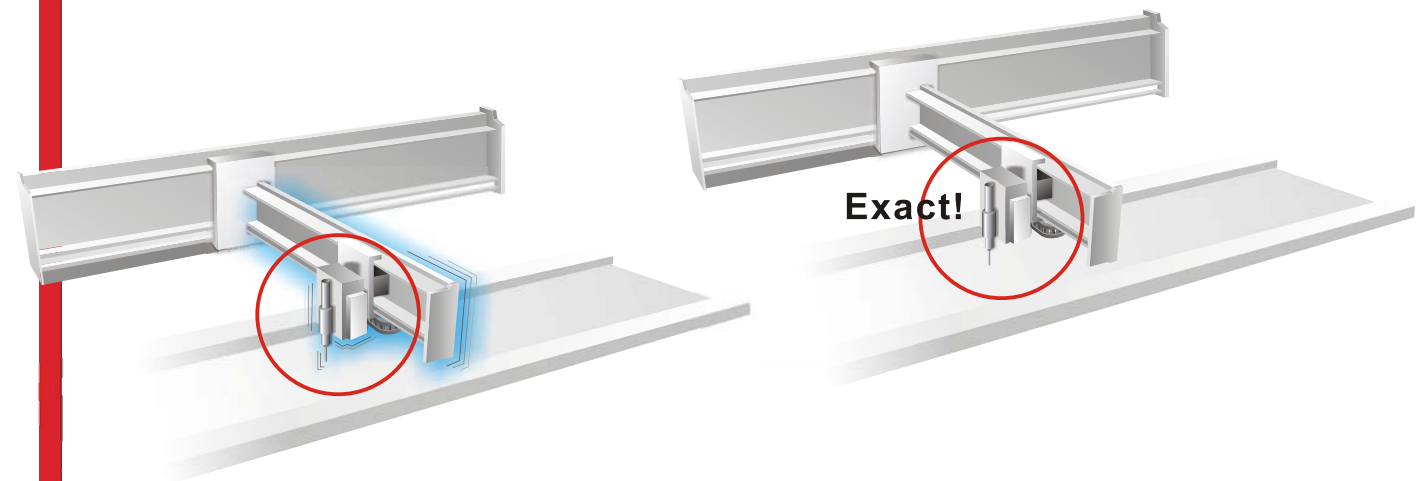
### Outstanding response characteristic

- Up to 1kHz frequency response.
- Settling time below 1ms.
- 10ms acceleration time from -3000r/min to 3000r/min when running without load.

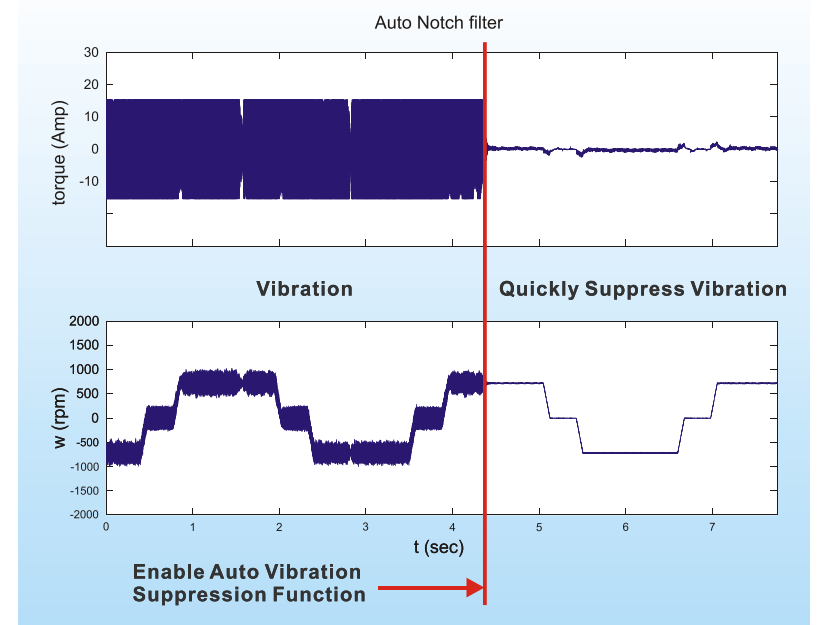


### Superlative vibration suppression for wide variety of applications

- Built-in auto low-frequency vibration suppression (for crane control): two vibration suppression filters are provided to minimize the vibration at machine edges automatically and sufficiently.



- Built-in auto high-frequency resonance suppression: two auto notch filters are provided to suppress the mechanical resonance automatically.



- Resonance points can be monitored upon FFT (Fast Fourier Transform) function of ASDA-A2-Soft configuration software so as to complete the suppression more precisely.

# ASDA-A2 AC Servo System

# ASDA-A2



## Features

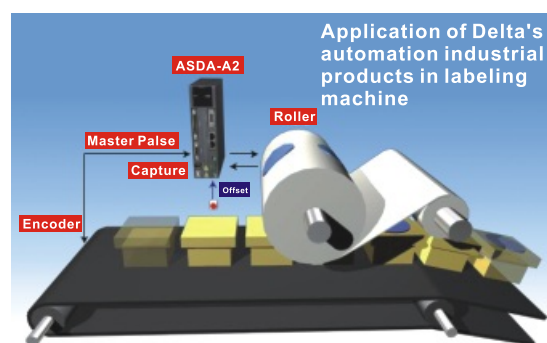
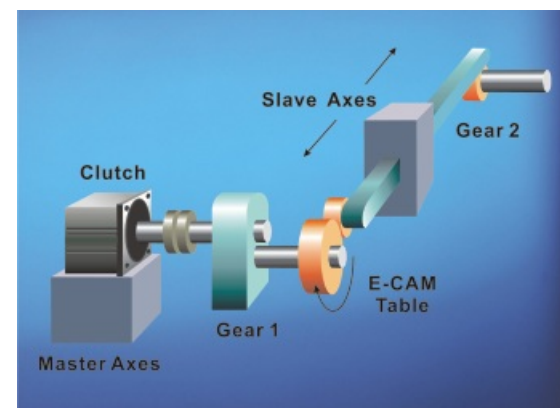
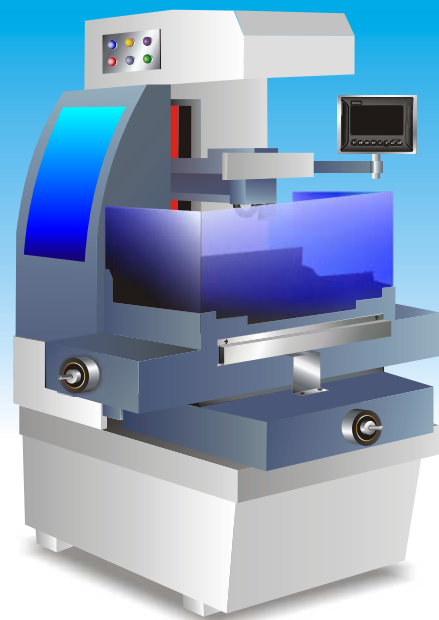
### ● Full Closed-Loop Control (Capable of reading second feedback signals)

- Built-in position feedback interface (CN5) is able to read second feedback signals from motor encoder and send the current position back to the drive to form a full closed-loop so that high accuracy position control can be accomplished.
- Reduce the effects of mechanical imperfections such as backlash and flexibility to ensure the position precision at machine edges.

### ● Unique Built-in Electronic Cam (E-CAM)

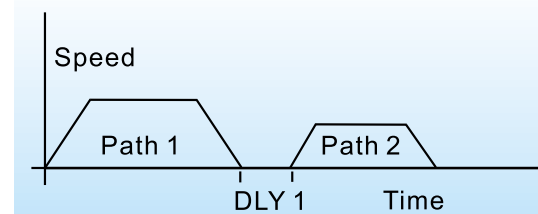
- Up to 720 E-CAM points.
- Smooth interpolation between points can be completed automatically to yield a flexible programming.
- ASDA-A2-Soft configuration software provides electronic cam (E-CAM) profile editing function.
- Applicable for rotary cutoff and flying shear applications.

### CNC Wire-cutting Machines

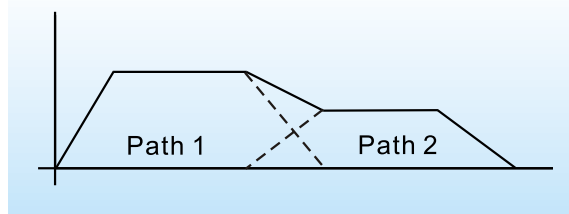


### ● Flexible Internal Position Mode (Pr Mode)

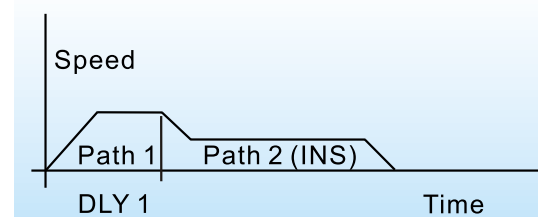
- ASDA-A2-Soft configuration software provides internal parameter editing function for defining the path of each axis freely.
- 64 internal position settings are offered for continuous motion control.
- Destination position, speed and acceleration & deceleration commands could be changed in the middle of operation.
- 5 control modes are available: 35 kinds of homing modes, program jump mode, parameter write-in mode, speed mode and position mode.



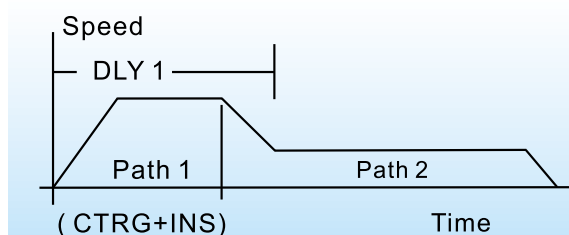
Path In Order



Path Overlap

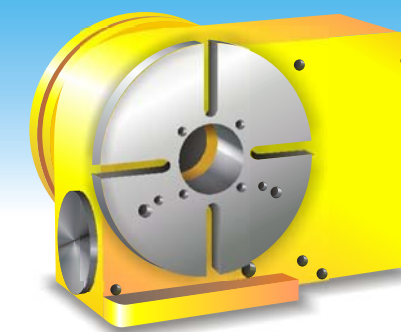


Internal Interrupt



External Interrupt

### Rotary Table





# ASDA-A2 AC Servo System

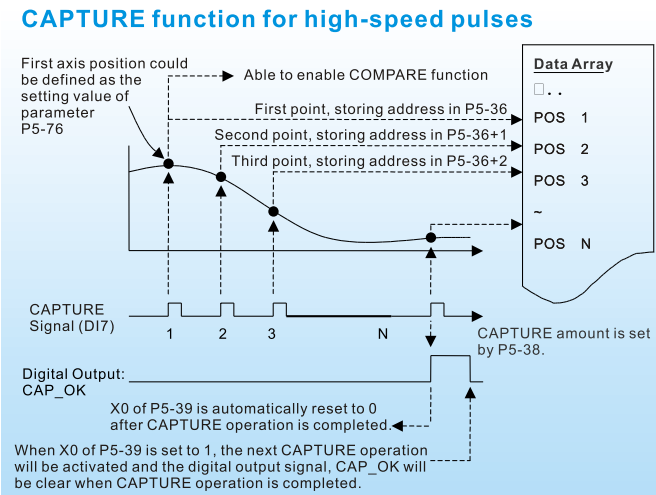
# ASDA-A2

## Features

### Real-time CAPTURE and COMPARE functions

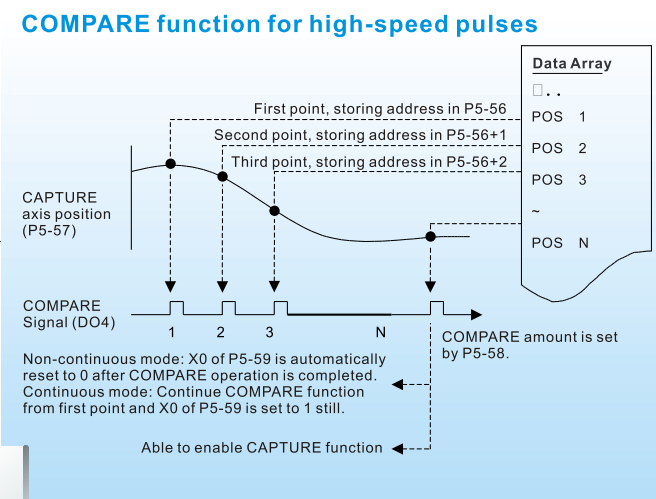
#### CAPTURE function for high-speed pulses

- Capable of capturing the instant position coordinate of motion axis. Response time is 5us.
- Applicable for the applications of digital color mark sensors.

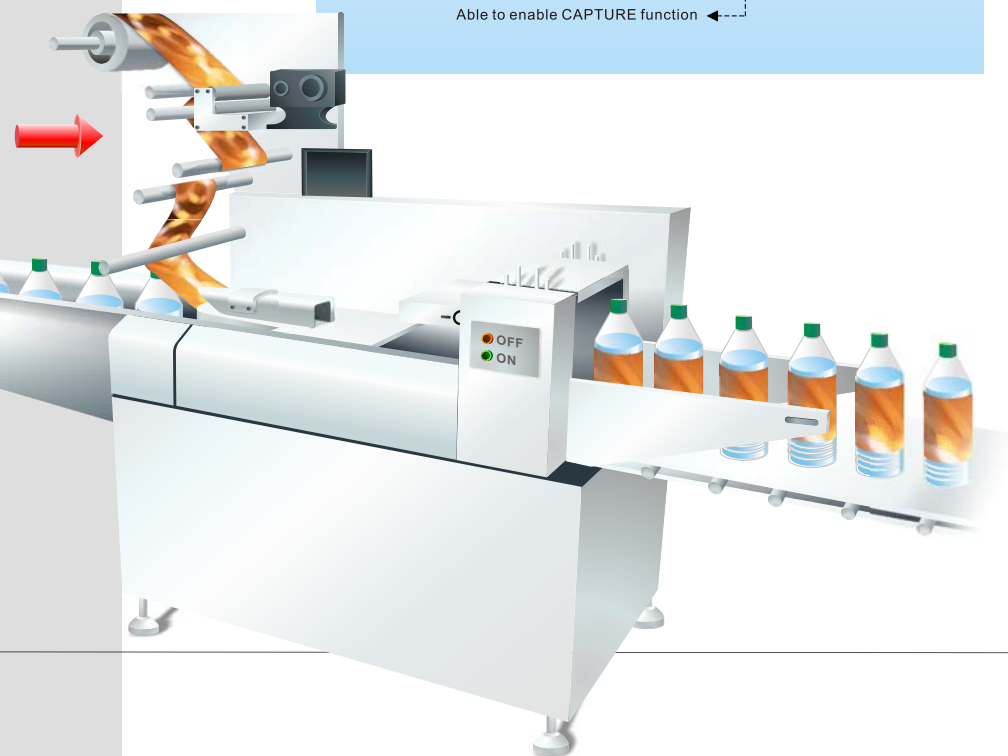


#### COMPARE function for high-speed pulses

- Capable of reaching preset position coordinate of motion axis and outputting pulses instantly. Response time is 5us.
- Applicable for the applications of industrial CCD camera.



### Application of Delta's ASDA-A2 series in high-speed label inserting machine



### Fieldbus Communication Network (Support CANopen protocol)

- CANbus communication speed is 1M bps, in comply with CANopen DS301 standard.
- CANopen motion modes are provided for CANopen DS402 standard.
- Station configuration can be set via parameter settings.
- In conjunction with Delta's PLC, it is able to save the wiring and establish Delta fieldbus system configuration.
- Capable of reading and writing servo drive parameters in any mode through CANopen communication.

### Delta High-speed Communication Network



DVP28SV11T + DVPCOPM-SL

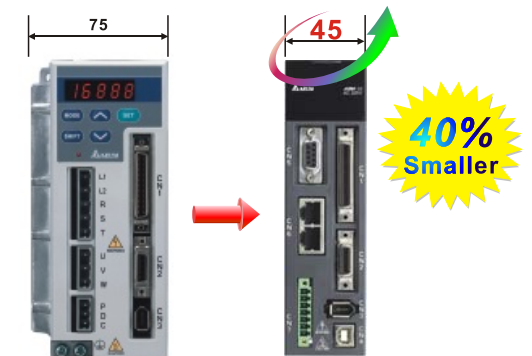
### CANopen



.....127 maximum

### Compact and Slim Design

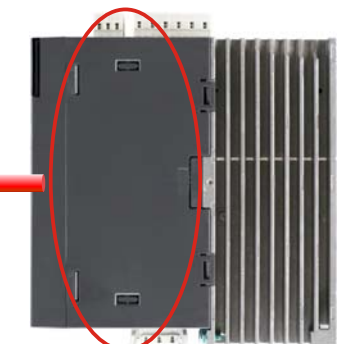
- New ASDA-A2 series is now more compact and slimmer. Overall width has been reduced by 40% from previous ASDA-A series.
- Compact size for side by side installation, requiring minimal space between units in a small enclosure (2mm).



### Versatile Expandability

- Extension port at right side of the servo drive is for connecting a variety of options to extend the functionality and meet the requirements of various applications.

Extension port at right side





# ASDA-A2 Servo Drive and Motor Combinations

# ASDA-A2

## Product Line-up

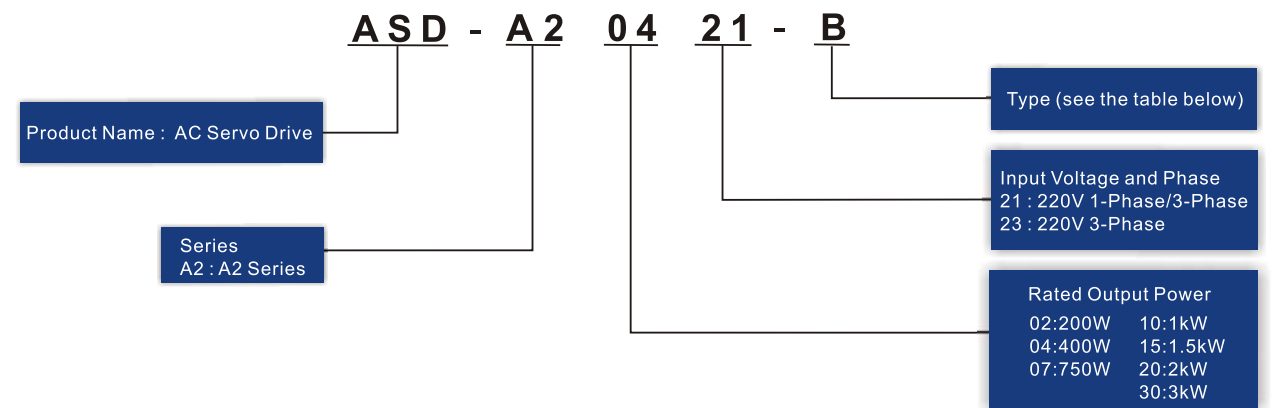
Servo Drive							
	0.2kW	0.4kW	0.75kW	1.0kW	1.5kW	2kW	3kW
	ASD-A2-0221-□	ASD-A2-0421-□	ASD-A2-0721-□	ASD-A2-1021-□	ASD-A2-1521-□	ASD-A2-2023-□	ASD-A2-3023-□

Servo Motor							
	ECMA-C10602□S	ECMA-C10604□S ECMA-C10804□7 ECMA-E11305□S ECMA-G11303□S	ECMA-C10807□S ECMA-G11306□S	ECMA-C11010□S ECMA-E11310□S ECMA-G11309□S*	ECMA-E11315□S	ECMA-C11020□S ECMA-E11320□S ECMA-E11820□S	ECMA-E11830□S ECMA-F11830□S

Note : 1. The boxes □ at the ends of the servo drive model names are for optional configurations (second feedback signal, CANopen and extension digital input port). 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. \* Will be available soon

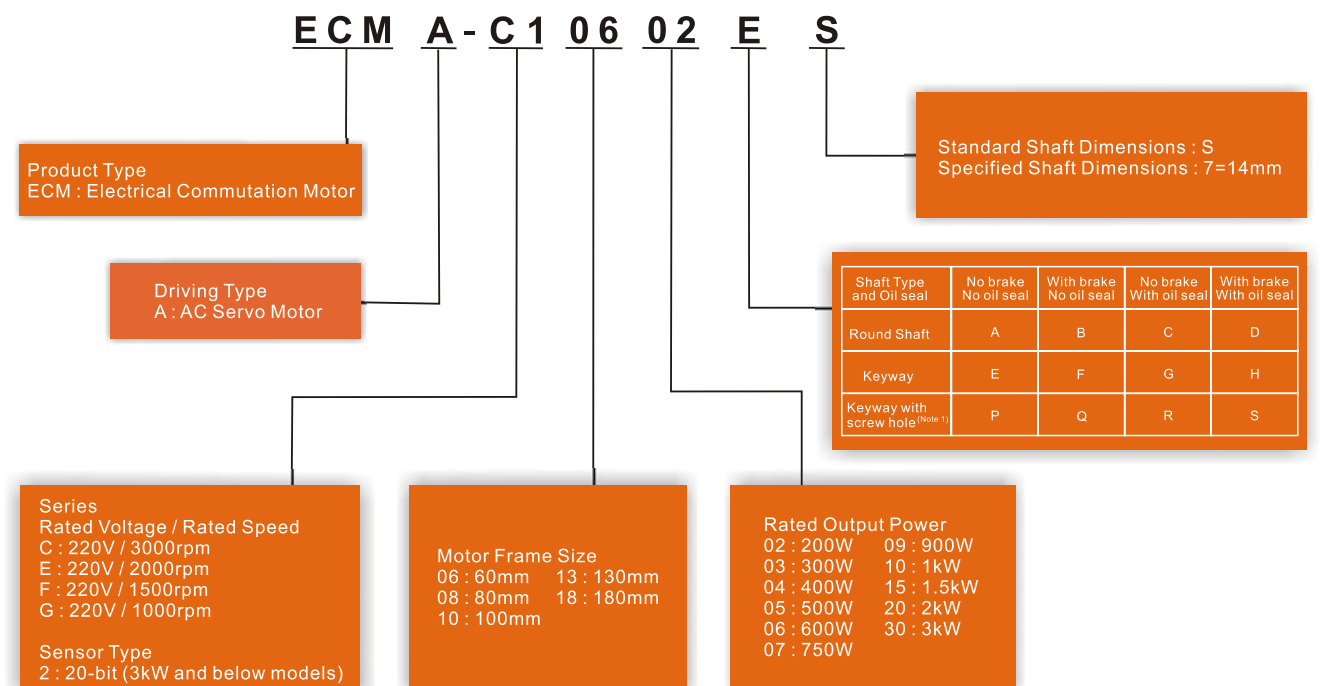
## Model Explanation

### ASDA-A2 Series Servo Drive



Type	Second Feedback Signal (For full closed-loop control)	CANopen	Digital Input Extension Port
M (Communication Type)	Yes	Yes	No
U (Internal Position Control Type)	Yes	No	Yes

### ECMA series Servo Motor



Note : 1 Only frame size 180mm servo motors are available.

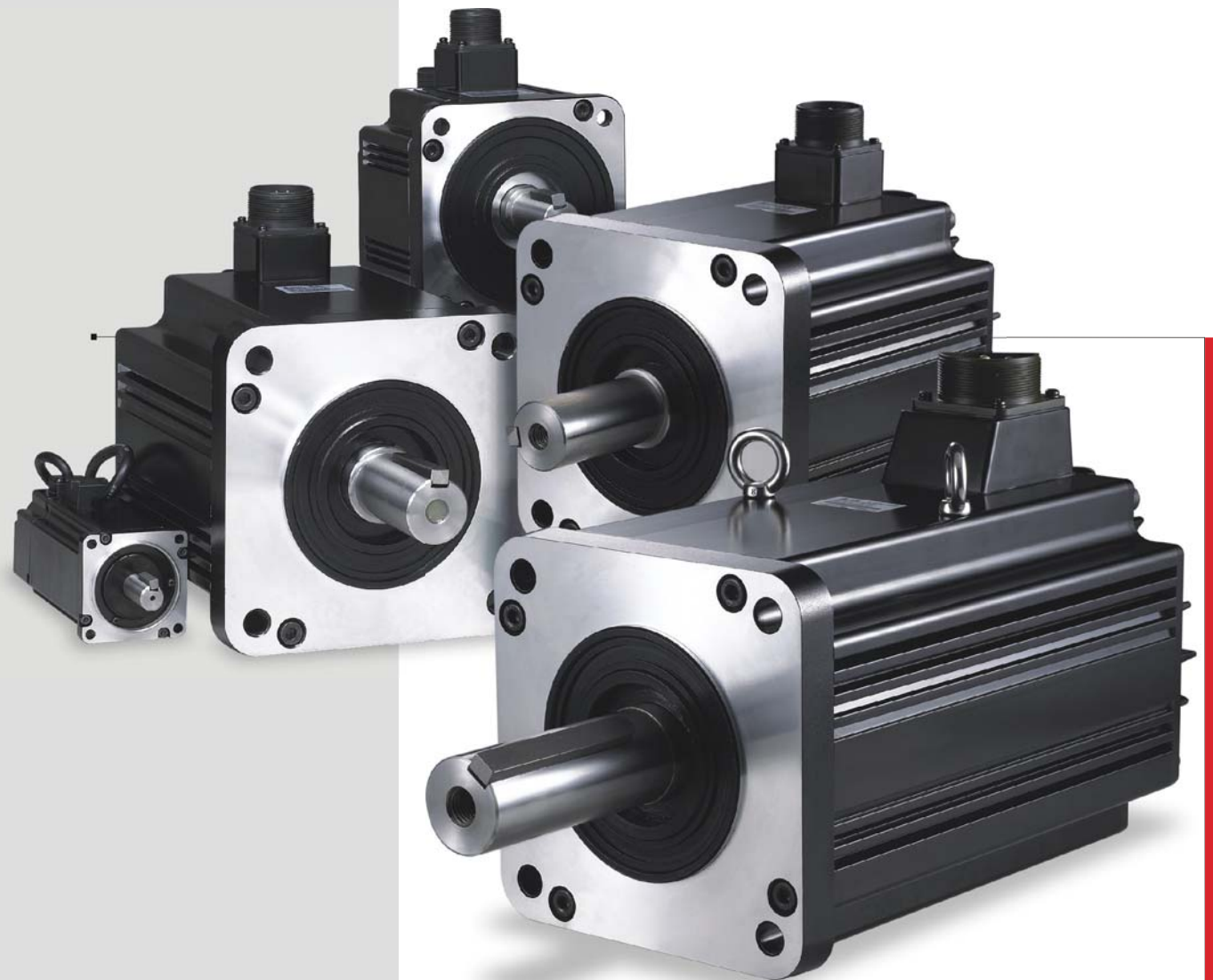


## ECMA Series Servo Motors



# ASDA-A2

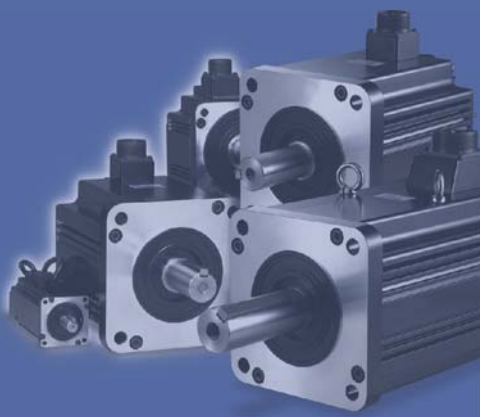
### Features

**ECMA** series servo motors are permanent AC servo motors from 200W to 3kW, capable of combining with 200 to 230V ASDA-A2 series AC servo drives. There are 60mm, 80mm, 100mm, 130mm and 180mm six kinds of frame sizes are available. The motor speed is from 1000 r/min to 5000 r/min and the torque output is from 1.92 N-M to 57.29 N-M. In terms of optional configurations, ECMA series provides brake and oil seal to fully support our customers' needs. In addition, it also offers round shaft and keyway two different shaft selections for various applications.



### Specifications Low Inertia Series

Model: ECMA Series	C106		C108		C110	
	02	04	04	07	10	20
Rated output power (kW)	0.2	0.4	0.4	0.75	1.0	2.0
Rated torque (N-m)	0.64	1.27	1.27	2.39	3.18	6.37
Maximum torque (N-m)	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)	1.55	2.6	2.6	5.1	7.3	12.05
Maximum current (A)	4.6	7.8	7.8	15.3	21.9	36.15
Power rating (kW/s)	22.4	57.6	24.0	50.4	38.1	90.6
Rotor moment of inertia (Kg.m <sup>2</sup> ) (without brake)	0.177E-4	0.277E-4	0.68E-4	1.13E-4	2.65E-4	4.15E-4
Mechanical time constant (ms)	0.80	0.53	0.74	0.63	0.74	0.61
Torque constant-KT (N-m/A)	0.41	0.49	0.49	0.47	0.44	0.53
Voltage constant-KE (mV/(r/min))	16	17.4	18.5	17.2	16.8	19.2
Armature resistance (Ohm)	2.79	1.55	0.93	0.42	0.20	0.13
Armature inductance (mH)	12.07	6.71	7.39	3.53	1.81	1.50
Electrical time constant (ms)	4.3	4.3	7.96	8.37	9.3	11.4
Insulation class	Class A (UL), Class B (CE)					
Insulation resistance	>100M, DC 500V					
Insulation strength	1500V AC, 60 seconds					
Weight (kg) (without brake)	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)	196	196	245	245	490	490
Max. thrust shaft load (N)	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.m <sup>2</sup> ) (with brake)	0.192-E-4	0.30-E-4	0.73-E-4	1.18-E-4	3.33E-4	4.953-E-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	15					
Operating temperature	0~40					
Storage temperature	-10~80					
Operating humidity	20~90%RH (non-condensing)					
Storage humidity	20~90%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	 					



# ECMA Series Servo Motors

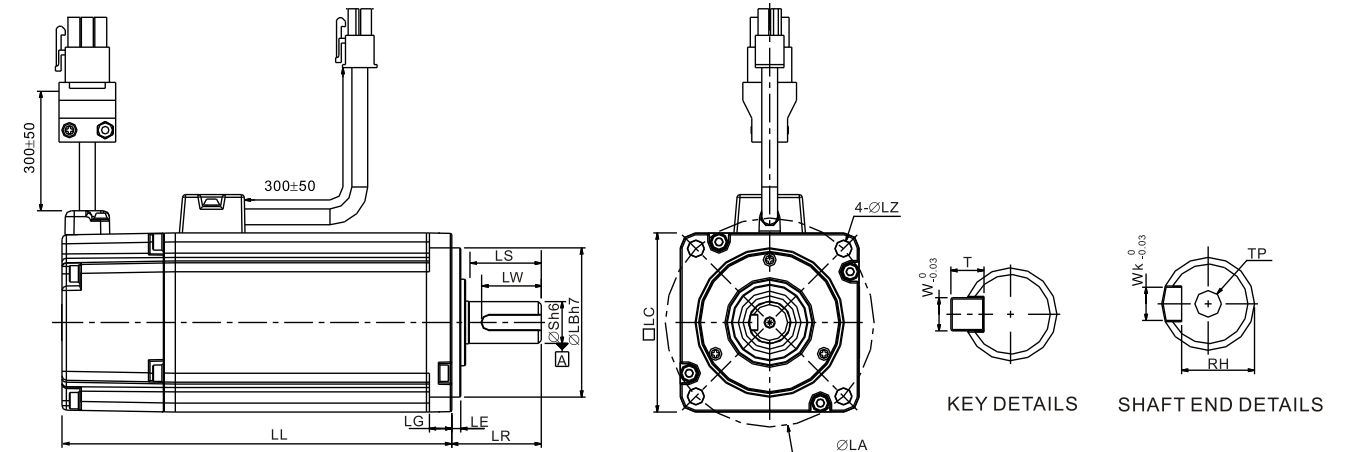
# ASDA-A2

## Specifications Medium-High Inertia Series

Model: ECMA Series	E113				E118		F118	G113		
	05	10	15	20	20	30	30	03	06	09
Rated output power (kW)	0.5	1.0	1.5	2.0	2.0	3.0	3.0	0.3	0.6	0.9
Rated torque (N-m)	2.39	4.77	7.16	9.55	9.55	14.32	19.10	2.86	5.73	8.59
Maximum torque (N-m)	7.16	14.3	21.48	28.65	28.65	42.97	57.29	8.59	17.19	21.48
Rated speed (r/min)	2000						1500	1000		
Maximum speed (r/min)	3000							2000		
Rated current (A)	2.9	5.6	8.3	11.01	11.22	16.1	19.4	2.5	4.8	7.5
Maximum current (A)	8.7	16.8	24.9	33.03	33.66	48.3	58.2	7.5	14.4	22.5
Power rating (kW/s)	7.0	27.1	45.9	62.5	26.3	37.3	66.4	10.0	39.0	66.0
Rotor moment of inertia (Kg.m <sup>2</sup> ) (without brake)	8.17E-4	8.41E-4	11.18E-4	14.59E-4	34.68E-4	54.95E-4	54.95E-4	8.17E-4	8.41E-4	11.18E-4
Mechanical time constant (ms)	1.91	1.51	1.10	0.96	1.62	1.06	1.28	1.84	1.40	1.06
Torque constant-KT (N-m/A)	0.83	0.85	0.87	0.87	0.85	0.89	0.98	1.15	1.19	1.15
Voltage constant-KE (mV/(r/min))	30.9	31.9	31.8	31.8	31.4	32	35	42.5	43.8	41.6
Armature resistance (Ohm)	0.57	0.47	0.26	0.174	0.119	0.052	0.077	1.06	0.82	0.43
Armature inductance (mH)	7.39	5.99	4.01	2.76	2.84	1.38	1.27	14.29	11.12	6.97
Electrical time constant (ms)	12.96	12.88	15.31	15.86	23.87	26.39	16.51	13.55	13.50	16.06
Insulation class	Class A (UL), Class B (CE)									
Insulation resistance	>100M, DC 500V									
Insulation strength	1500V AC, 60 seconds									
Weight (kg) (without brake)	6.8	7	7.5	7.8	13.5	18.5	18.5	6.8	7	7.5
Weight (kg) (with brake)	8.2	8.4	8.9	9.2	17.5	22.5	22.5	8.2	8.4	8.9
Max. radial shaft load (N)	490	490	490	490	1176	1470	1470	490	490	490
Max. thrust shaft load (N)	98	98	98	98	490	490	490	98	98	98
Power rating (kW/s) (with brake)	6.4	24.9	43.1	59.7	24.1	35.9	63.9	9.2	35.9	62.1
Rotor moment of inertia (Kg.m <sup>2</sup> ) (with brake)	8.94-E-4	9.14-E-4	11.90-E-4	15.88-E-4	37.86-E-4	57.06-E-4	57.06-E-4	8.94-E-4	9.14-E-4	11.9-E-4
Mechanical time constant (ms) (with brake)	2.07	1.64	1.19	1.05	1.77	1.10	1.33	2.0	1.51	1.13
Brake holding torque [Nt-m (min)]	16.5	16.5	16.5	16.5	25	25	25	16.5	16.5	16.5
Brake power consumption (at 20°C) [W]	21.0	21.0	21.0	21.0	31.1	31.1	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	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	25.0	25.0
Vibration grade	15									
Operating temperature	0~40									
Storage temperature	-10~80									
Operating humidity	20~90%RH (non-condensing)									
Storage humidity	20~90%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										

## Dimensions

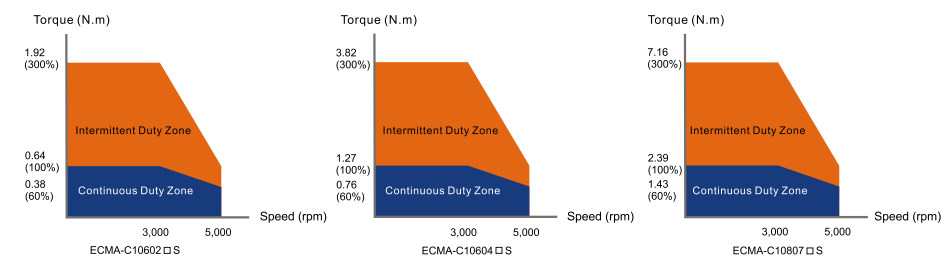
### ECMA Series Servo Motors Frame Size 80mm and below (Units: mm)



Model	C10602□S	C10604□S	C10804□7	C10807□S
LC	60	60	80	80
LZ	5.5	5.5	6.6	6.6
LA	70	70	90	90
S	14	14	14	19
LB	50	50	70	70
LL(Without Brake)	105.5	130.7	112.3	138.3
LL(With Brake)	141.6	166.8	152.8	178
LS(Without Oil Seal)	27	27	27	32
LS(With Oil Seal)	24	24	24.5	29.5
LR	30	30	30	35
LE	3	3	3	3
LG	7.5	7.5	8	8
LW	20	20	20	25
RH	11	11	11	15.5
WK	5	5	5	6
W	5	5	5	6
T	5	5	5	6
TP	M4xP0.7 Depth:15mm	M4xP0.7 Depth:15mm	M4xP0.7 Depth:15mm	M6xP1 Depth:20mm

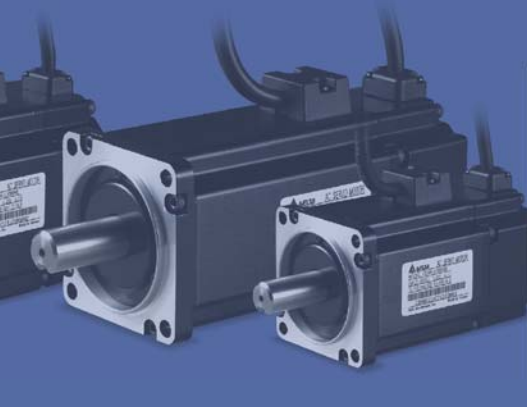
**NOTE**  
 1) Dimensions are in millimeters. Weights are in kilograms (kg) and (pounds (lbs)).  
 2) Dimensions and weights of the servo motor may be revised without prior notice.  
 3) The boxes (□) in the model names are for optional configurations (keyway, brake and oil seal).

## Speed-Torque Curves (T-N Curves)



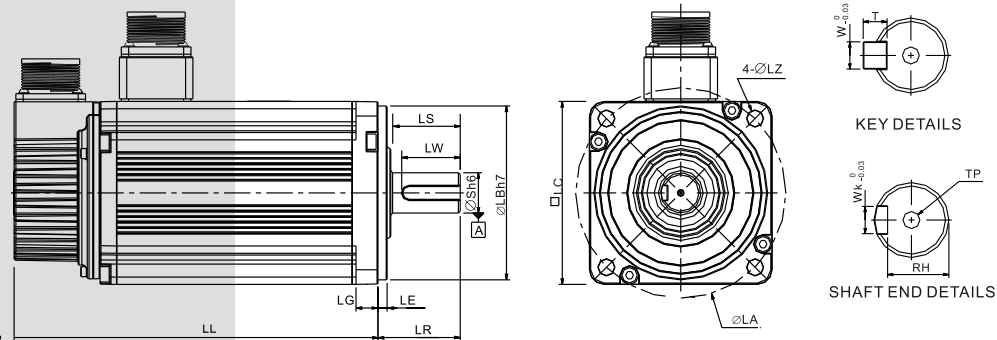
# ECMA Series Servo Motors

# ASDA-A2



## Dimensions

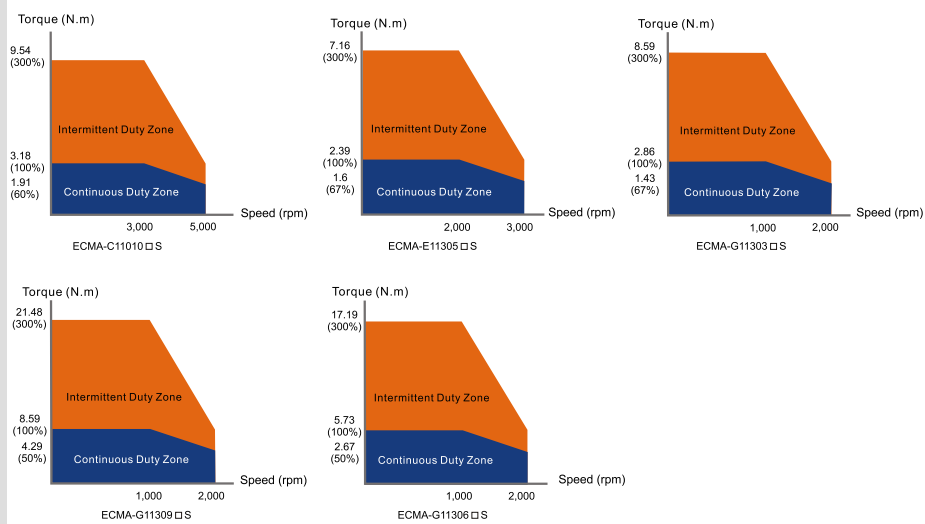
### ECMA Series Servo Motors Frame Size 100mm and above (Units: mm)



Model	G11303□S	E11305□S	G11306□S	G11309□S	C11010□S
LC	130	130	130	130	100
LZ	9	9	9	9	9
LA	145	145	145	145	115
S	22	22	22	22	22
LB	110	110	110	110	95
LL(Without Brake)	147.5	147.5	147.5	163.5	153.25
LL(With Brake)	183.5	183.5	183.5	198	192.5
LS	47	47	47	47	37
LR	55	55	55	55	45
LE	6	6	6	6	5
LG	11.5	11.5	11.5	11.5	12
LW	36	36	36	36	32
RH	18	18	18	18	18
WK	8	8	8	8	8
W	8	8	8	8	8
T	7	7	7	7	7
TP	M6xP1 Depth:20mm	M6xP1 Depth:20mm	M6xP1 Depth:20mm	M6xP1 Depth:20mm	M6xP1 Depth:20mm

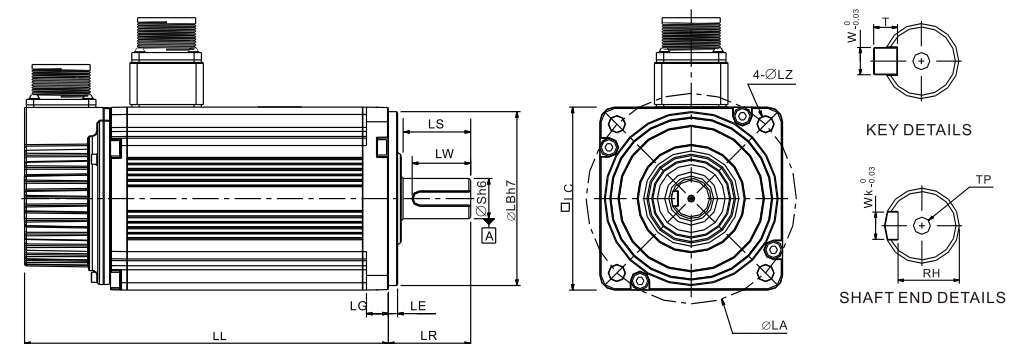
**NOTE** 1) Dimensions are in millimeters. Weights are in kilograms (kg) and (pounds (lbs)).  
 2) Dimensions and weights of the servo motor may be revised without prior notice.  
 3) The boxes (□) in the model names are for optional configurations (keyway, brake and oil seal).

## Speed-Torque Curves (T-N Curves)



## Dimensions

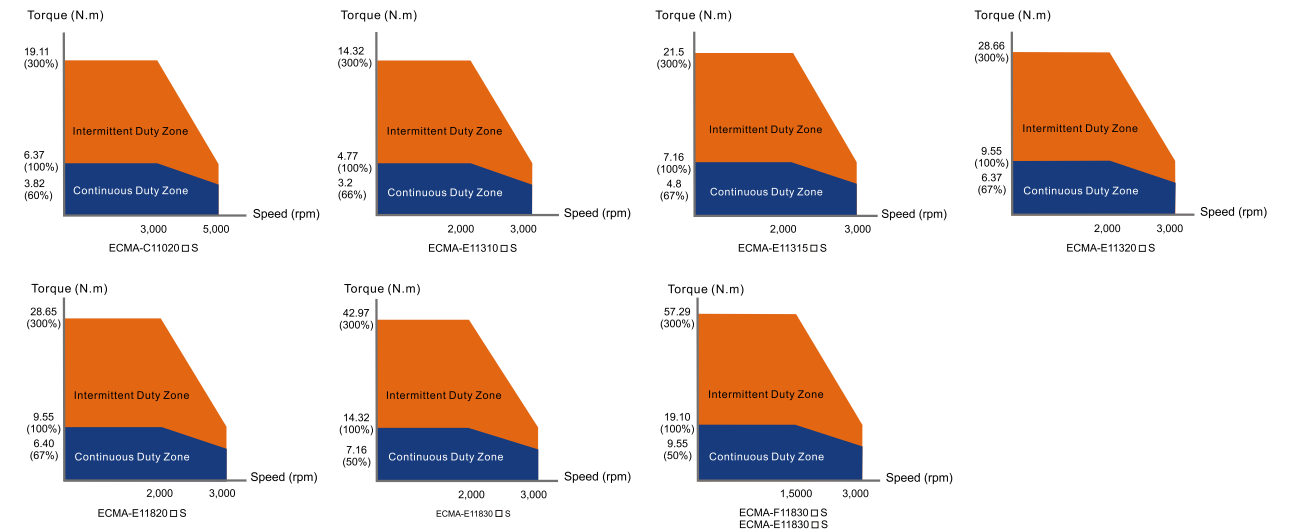
### ECMA Series Servo Motors Frame Size 100mm and above (Units: mm)



Model	E11310□S	E11315□S	C11020□S	E11320□S	E11820□S	E11830□S	F11830□S
LC	130	130	100	130	180	180	180
LZ	9	9	9	9	13.5	13.5	13.5
LA	145	145	115	145	200	200	200
S	22	22	22	22	35	35	35
LB	110	110	95	110	114.3	114.3	114.3
LL(Without Brake)	147.5	167.5	199	187.5	169	202.1	202.1
LL(With Brake)	183.5	202	226	216	203.1	235.3	235.1
LS	47	47	37	47	73	73	73
LR	55	55	45	55	79	79	79
LE	6	6	5	6	4	4	4
LG	11.5	11.5	12	11.5	20	20	20
LW	36	36	32	36	63	63	63
RH	18	18	18	18	30	30	30
WK	8	8	8	8	10	10	10
W	8	8	8	8	10	10	10
T	7	7	7	7	8	8	8
TP	M6xP1 Depth:20mm	M6xP1 Depth:20mm	M6xP1 Depth:20mm	M6xP1 Depth:20mm	M12xP1.75 Depth:25mm	M12xP1.75 Depth:25mm	M12xP1.75 Depth:25mm

**NOTE** 1) Dimensions are in millimeters. Weights are in kilograms (kg) and (pounds (lbs)).  
 2) Dimensions and weights of the servo motor may be revised without prior notice.  
 3) The boxes (□) in the model names are for optional configurations (keyway, brake and oil seal).

## Speed-Torque Curves (T-N Curves)



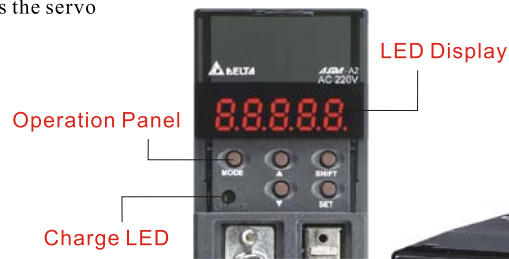
# ASDA-A2 Series Servo Drives

# ASDA-A2

## Part Names and Functions

### LED Display / Operation Panel / Charge LED

- LED Display  
The 5 digit, 7 segment LED displays the servo status or fault codes.
- Operation Panel  
Used function keys to perform status display, monitor and diagnostic, function and parameter setting.  
Function Keys:  
MODE : Press this key to select/change mode  
SHIFT : Press this key to shift cursor to the left  
UP : Press this key to increase values on the display  
DOWN : Press this key to decrease values on the display  
SET : Press this key to store data
- Charge LED  
A lit LED indicates that either power is connected to the servo drive or a residual charge is present in the drive's internal power components.



### \* Second Signal Feedback Port

- Used to connect optical linear scale and encoder for controlling A, B, Z phase signals.

### I/O Interface

- Used to connect Delta's DVP series PLC or other external controllers for controlling I/O signals.

### \* High-speed Communication Port

- Used to connect CANopen networks. 1-in/1-out communication ports are easy for serial connection.
- CANbus interface, supporting motion modes for CANopen Ds402 implementation.

### Motor Encoder Interface

- Used to connect the encoder of the servo motor

### \* Extension Digital Input Connection Port

- Used to connect removable digital input terminal block. Max. 6 digital inputs could be added.

### Serial Communication Port

- Used to connect PLC, HMI, etc. controllers for RS-485 / RS-232 serial communication.

### USB Connection Port

- Used to connect personal computer or notebook. Ver 1.1 USB is equipped as standard.
- Direct connectivity to personal computer or notebook, capable of accessing data through ASDA-A2 Soft configuration software.
- Monitor speed upon software is up to 1Mbps.

### Internal & External Regenerative Resistor Terminal / Control Circuit Terminal / Main Circuit Terminal

- Internal & External Regenerative Resistor Terminal
  1. When using an external resistor, connect it to P $\oplus$  and C, and ensure an open circuit between P $\oplus$  and D.
  2. When using an internal resistor, ensure the circuit is closed between P $\oplus$  and D, and the circuit is open between P $\oplus$  and C.
  3. When using external braking unit, connect braking unit to P $\oplus$  and  $\ominus$ , and ensure an open circuit between P $\oplus$  and D, and P $\oplus$  and C.
- Control Circuit Terminal (L1c, L2c) Used to connect 200~230Vac, 50/60Hz single-phase or three-phase Vac supply.
- Main Circuit Terminal (R, S, T) Used to connect 200~230Vac, 50/60Hz commercial power supply.
- When using external braking unit, connect braking unit to P $\oplus$  and  $\ominus$ .

### Servo Motor Output (U, V, W)

- Used to connect servo motor. Never connect the output terminal to main circuit power as the AC drive may be destroyed beyond repair if incorrect cables are connected to the output terminals.

### Extension Port

### Ground Terminal

- Used to connect grounding wire of power supply and servo motor.

### Heatsink

- Used to secure servo drive and for heat dissipation.

Please note:  
\*This is a Delta optional part.





# ASDA-A2 Series Servo Drives

# ASDA-A2

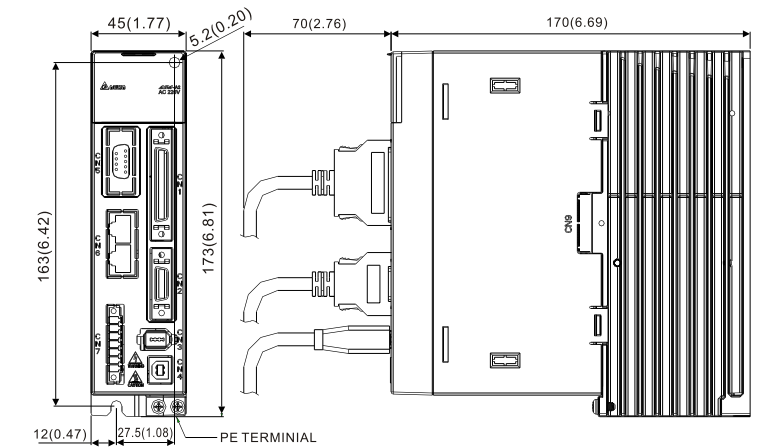
## Specifications

ASDA-A2 Series		200W	400W	750W	1kW	1.5kW	2kW	3kW		
Power supply	Phase / Voltage	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		20-bit (1280000 p/rev)								
Control of Main Circuit		SVPWM Control								
Tuning Modes		Max. 500Kpps (Line driver), Max. 200Kpps (Open collector);Max. 4Mpps (Line receiver)								
Dynamic Brake		None				Built-in				
Position Control Mode	Max. Input Pulse Frequency	Max. 500Kpps (Line driver), Max. 200Kpps (Open collector) Max. 4Mpps (Line receiver)								
	Pulse Type	Pulse + Direction, A phase + B phase, CCW pulse + CW pulse								
	Command Source	External pulse train (Pt mode) / Internal parameters (Pr mode)								
	Smoothing Strategy	Low-pass and Moving 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								
Speed Control Mode	Feed Forward Compensation	Set by parameters								
	Analog Input Command	Voltage Range	0~±10 VDC							
		Input Resistance	10K Ω							
		Time Constant	2.2 μs							
	Speed Control Range <sup>1</sup>	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 1kHz								
	Speed Accuracy <sup>2</sup> (at rated rotation speed)	0.01% or less at load fluctuation 0 to 100%								
0.01% or less at power fluctuation ±10%										
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, Position command selection, 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, 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								
	Output	Encoder signal output (A, B, Z Line Driver and Z Open Collector )								
Protective Functions		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 comm and completed, Capture operation completed output, Motion control completed output, Master position of E-CAM (electronic CAM)								
Communication Interface		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, Full-closed loop excessive deviation, Serial communication error, Input power phase loss, Serial communication time out, short circuit protection of U, V, W, and CN1, CN2, CN3 terminals								
Environment	Installation Site		RS-232 / RS-485 / CANopen / USB							
	Altitude		Indoor location (free from direct sunlight), no corrosive liquid and gas (far away from oil mist, flammable gas, dust)							
	Atmospheric pressure		Altitude 1000m or lower above sea level							
	Operating Temperature		86kPa~106kPa							
	Storage Temperature		0°C ~ 55°C (If operating temperature is above 45°C, forced cooling will be required)							
	Humidity		-20°C~65°C							
	Vibration		0~90% RH(non-condensing)							
	IP Rating		9.80665m/s <sup>2</sup> (1G) less than 20Hz, 5.88m/ s <sup>2</sup> (0.6G) 20 to 50Hz							
Power System		IP20								
Approvals		TN System <sup>3</sup>								
		CE		UL		IEC / EN 61800-5-1, UL508C				

## Dimensions

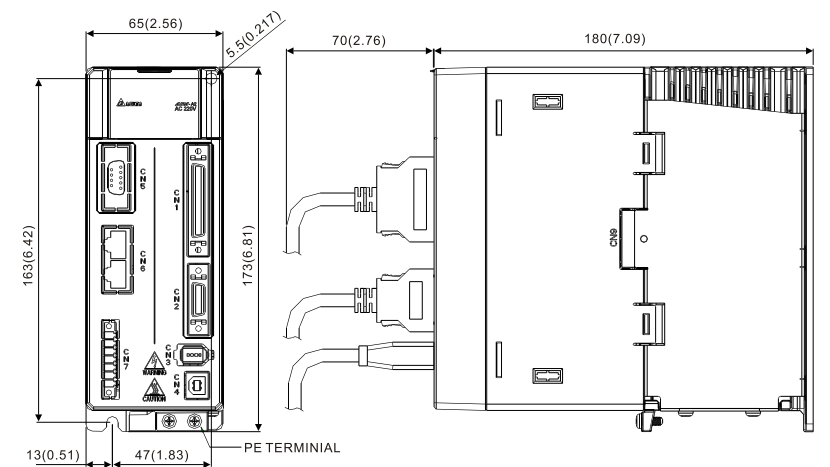
### 200W / 400W

Weight	1.5 (3.3)
--------	-----------



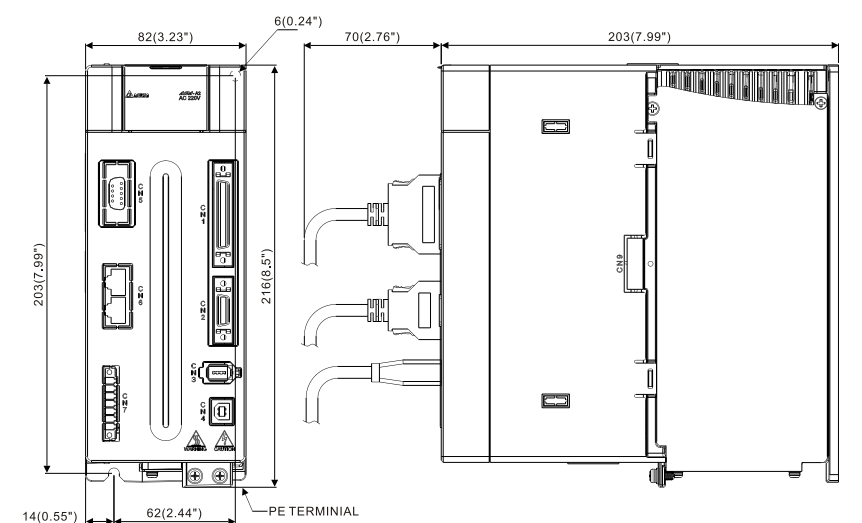
### 750W / 1.0kW / 1.5kW

Weight	2.0 (4.4)
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### 2.0kW / 3.0kW

Weight	2.89 (6.36)
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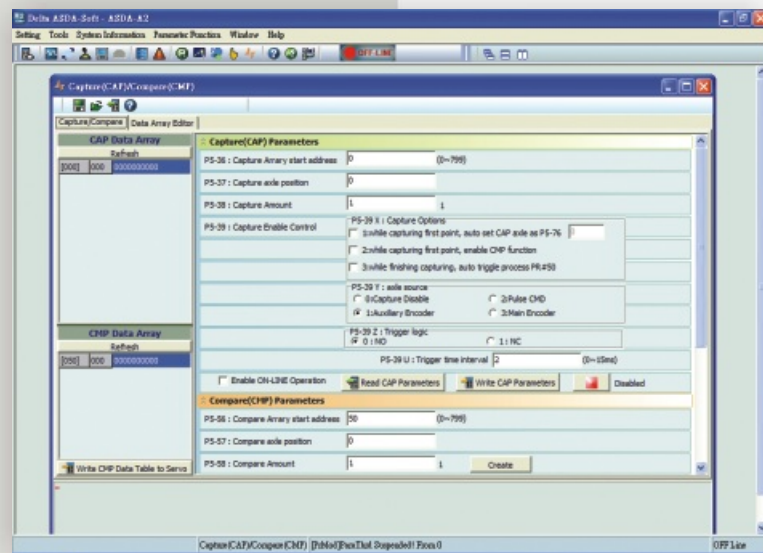
**NOTE** 1)Dimensions are in millimeters. Weights are in kilograms (kg) and pounds (lbs).  
2)Dimensions and weights of the servo motor may be revised without prior notice.

Footnote:<sup>1</sup>Rated rotation speed: When full load, speed ratio is defined as the minimum speed (the motor will not pause).  
<sup>2</sup>When command is rated rotation speed, the speed fluctuation rate is defined as: (Empty load rotation speed / Full load rotation speed) / Rated rotation speed  
<sup>3</sup>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.

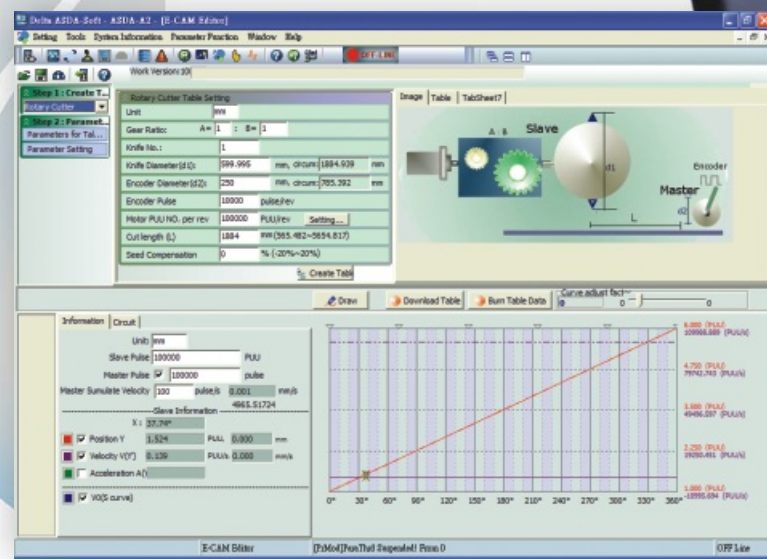
# ASDA-A2-SOFT Configuration Software

# ASDA-A2

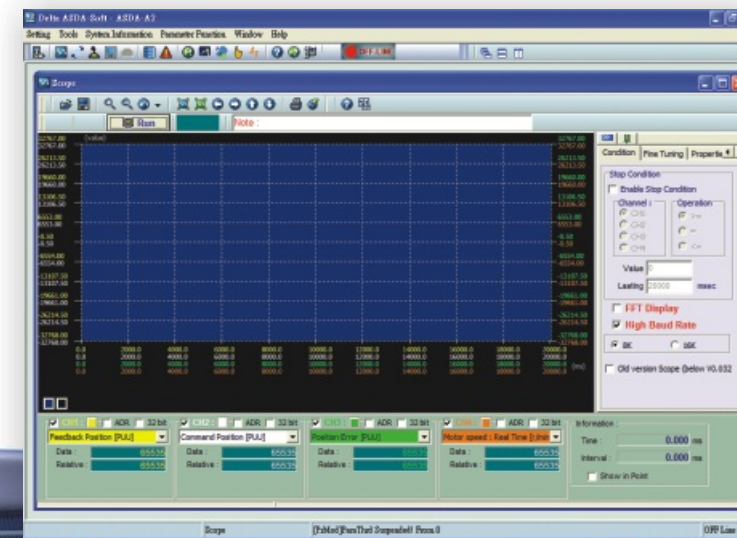
## Features



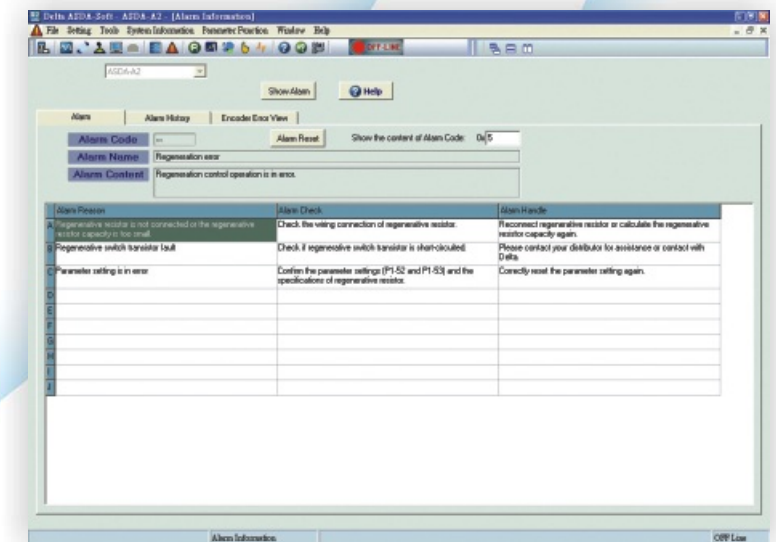
■ Strong CAPTURE and COMPARE functions for high-speed pulses help quickly complete configuration.



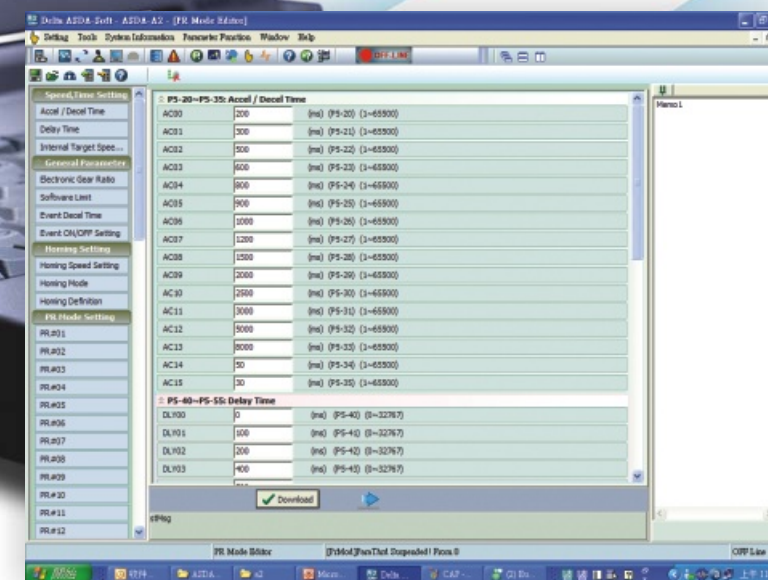
■ User-friendly E-CAM editing interface for designing E-CAM outlines and curves freely. In addition, quick settings for rotary cutoff and flying shear applications are provided as well.



■ Versatile on-line monitoring function, similar to a digital oscilloscope can quickly record the status and data of each axis. Real-time monitoring is not uncomplicated.



■ Convenient alarms function, capable of troubleshooting the system easily and recommending corrective actions timely.



■ Easy-to-use editing interface for enhanced internal position (Pr) control mode. Homing and point-to-point etc. functions for multi-axis position control are easily completed.

# ASDA-A2 Optional Accessories

# ASDA-A2

## Optional Units

### Quick Connector

- Used for 100W to 3kW servo drives.
- One operating lever is provided for wire to terminal block insertion.



### Power Cable

- 3m and 5m standard cables are available.
- Customized service is offering to meet the needs of the customers.
- Two types are selectable: with brake and without brake.



### Encoder Cable

- 3m and 5m standard cables are available.
- Customized service is offering to meet the needs of the customers.



### RS-232 Communication Cable

- Connects ASDA-A2 to PLC, HMI, etc. controllers via RS-232 communication.
- Standard cable length is 3m.



### Terminal Block Module

- Easy to installation and wiring.
- 0.5m connection cable is provided. Easy to reduce the space required.
- Easy to expand system's I/O configuration.



### Regenerative Resistor

- 400W/40Ohm and 1kW/20Ohm two kinds of specifications are available.
- Regarding the selection of regenerative resistor, please refer to the table of regenerative resistor specifications on catalogue page 38.



### USB Communication Cable (for PC)

- Connects ASDA-A2 to a PC (upon ASDA-A2 Soft configuration software).
- Ver 1.1 USB is equipped as standard.



### CANopen Accessories

- Using Delta TAP-CN03 distribution box can connect ASDA-A2 to Delta's PLC CAN Master.
- CANopen communication cable is provided. Standard cable length is 0.5m and 1m.

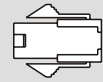


# ASDA-A2 Optional Accessories

# ASDA-A2

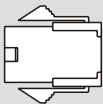
## Power Connectors

### ASDBCAPW0000



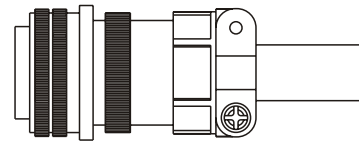
Title	Part No.	Manufacturer
Housing	C4201H00-2*2PA	JOWLE
Terminal	C4201TOP-2	JOWLE

### ASDBCAPW0100



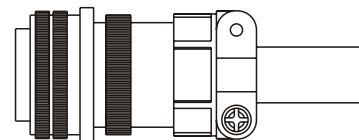
Title	Part No.	Manufacturer
Housing	C4201H00-2*3PA	JOWLE
Terminal	C4201TOP-2	JOWLE

### ASD-CAPW1000



MS 3106A-20-18S

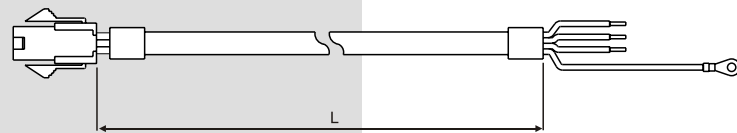
### ASD-CAPW2000



MS 3106A-24-11S

## Power Cables

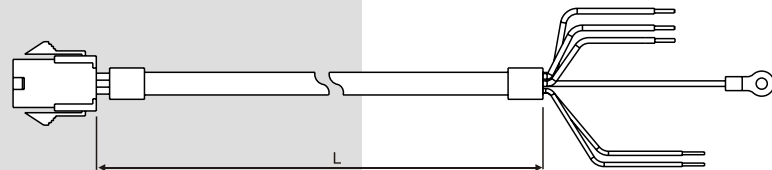
### ASD-ABPW0003, ASD-ABPW0005



Title	Part No.	Manufacturer
Housing	C4201H00-2*2PA	JOWLE
Terminal	C4201TOP-2	JOWLE

Item	Part No.	Straight	
		mm	inch
1	ASD-ABPW0003	3000±100	118±4
2	ASD-ABPW0005	5000±100	197±4

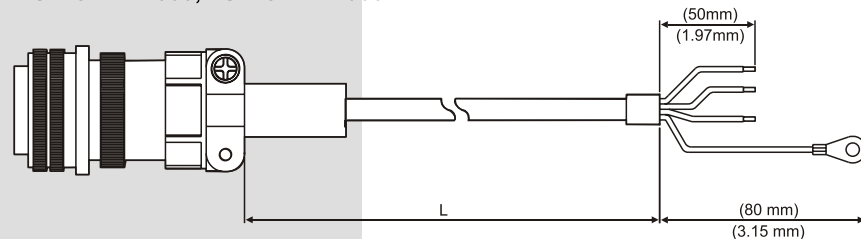
### ASD-ABPW0103, ASD-ABPW0105



Title	Part No.	Manufacturer
Housing	C4201H00-2*3PA	JOWLE
Terminal	C4201TOP-2	JOWLE

Item	Part No.	Straight	
		mm	inch
1	ASD-ABPW0103	3000±100	118±4
2	ASD-ABPW0105	5000±100	197±4

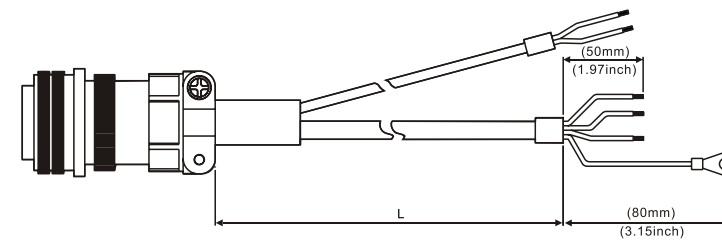
### ASD-CAPW1003, ASD-CAPW1005



Item	Part No.	Straight	L	
			mm	inch
1	ASD-CAPW1003	3106A-20-18S	3000±100	118±4
2	ASD-CAPW1005	3106A-20-18S	5000±100	197±4

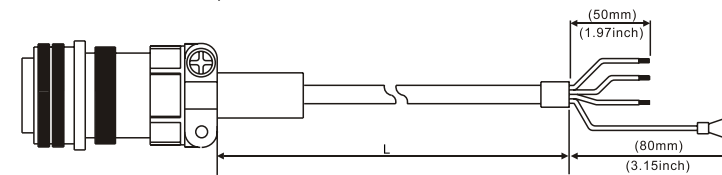
## Power Cables

### ASD-CAPW1103, ASD-CAPW1105



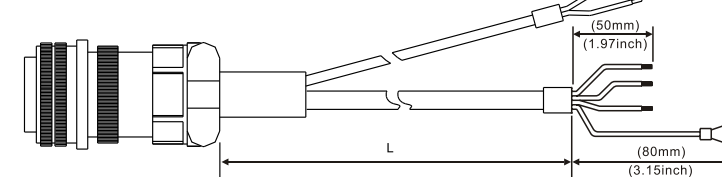
Item	Part No.	Straight	L	
			mm	inch
1	ASD-CAPW1103	3106A-20-18S	3000±100	118±4
2	ASD-CAPW1105	3106A-20-18S	5000±100	197±4

### ASD-A2PW1003, ASD-A2PW1005



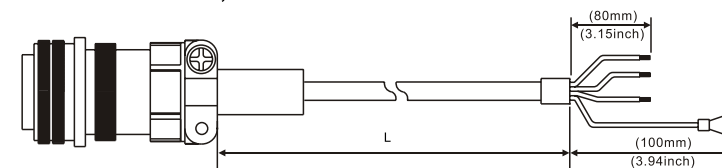
Item	Part No.	Straight	L	
			mm	inch
1	ASD-A2PW1003	3106A-20-18S	3000±100	118±4
2	ASD-A2PW1005	3106A-20-18S	5000±100	197±4

### ASD-A2PW1103, ASD-A2PW1105



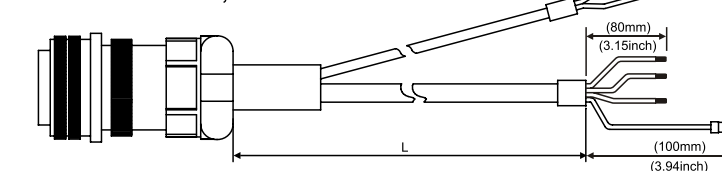
Item	Part No.	Straight	L	
			mm	inch
1	ASD-A2PW1103	3106A-20-18S	3000±100	118±4
2	ASD-A2PW1105	3106A-20-18S	5000±100	197±4

### ASD-CAPW2003, ASD-CAPW2005



Item	Part No.	Straight	L	
			mm	inch
1	ASD-CAPW2003	3106A-24-11S	3000±100	118±4
2	ASD-CAPW2005	3106A-24-11S	5000±100	197±4

### ASD-CAPW2103, ASD-CAPW2105



Item	Part No.	Straight	L	
			mm	inch
1	ASD-CAPW2103	3106A-24-11S	3000±100	118±4
2	ASD-CAPW2105	3106A-24-11S	5000±100	197±4

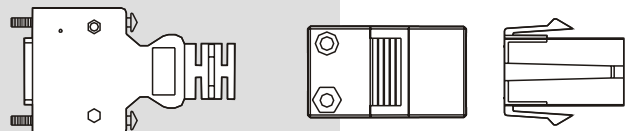


# ASDA-A2 Optional Accessories

# ASDA-A2

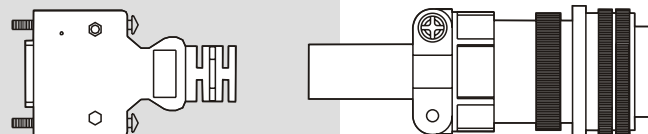
## Encoder Connectors

### ASD-ABEN0000



Title		Part No.	Manufacturer
MOTOR SIDE	Housing	AMP(1-172161-9)	AMP
	Terminal	AMP(170359-3)	AMP
	CLAMP	DELTA(34703237XX)	DELTA
DRIVE SIDE	PLUG	3M 10120-3000PE	3M
	SHELL	3M 10320-52A0-008	3M

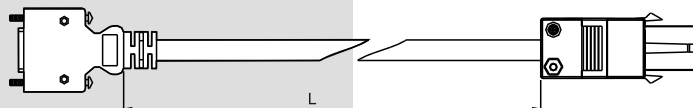
### ASD-CAEN1000



Title		Part No.	Manufacturer
MOTOR SIDE		3106A-20-29S	----
DRIVE SIDE	PLUG	3M 10120-3000PE	3M
	SHELL	3M 10320-52A0-008	3M

## Encoder Cables

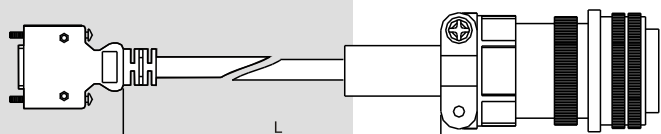
### ASD-ABEN0003, ASD-ABEN0005



Title		Part No.	Manufacturer
MOTOR SIDE	Housing	AMP(1-172161-9)	AMP
	Terminal	AMP(170359-3)	AMP
	CLAMP	DELTA(34703237XX)	DELTA
DRIVE SIDE	PLUG	3M 10120-3000PE	3M
	SHELL	3M 10320-52A0-008	3M

Item	Part No.	mm	L	inch
1	ASD-ABEN0003	3000±100		118±4
2	ASD-ABEN0005	5000±100		197±4

### ASD-CAEN1003, ASD-CAEN1005

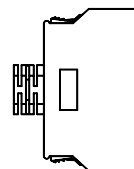


Title		Part No.	Manufacturer
MOTOR SIDE		3106A-20-29S	----
DRIVE SIDE	PLUG	3M 10120-3000PE	3M
	SHELL	3M 10320-52A0-008	3M

Item	Part No.	Straight	mm	L	inch
1	ASD-CAEN1003	3106A-20-29S	3000±100		118±4
2	ASD-CAEN1005	3106A-20-29S	5000±100		197±4

## IO Signal Connector (Cn1)

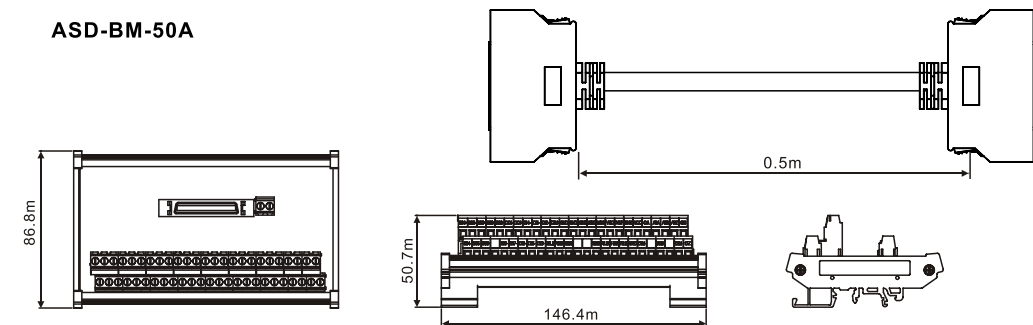
### ASD-CN5C0050



Vendor Name	Vendor P/N
3M TAIWAN LTD	10150-3000PE
3M TAIWAN LTD	10350-52A0-008

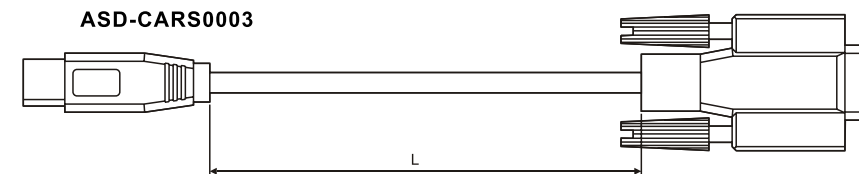
## Terminal Block Module

### ASD-BM-50A



## RS-232 Communication Cable

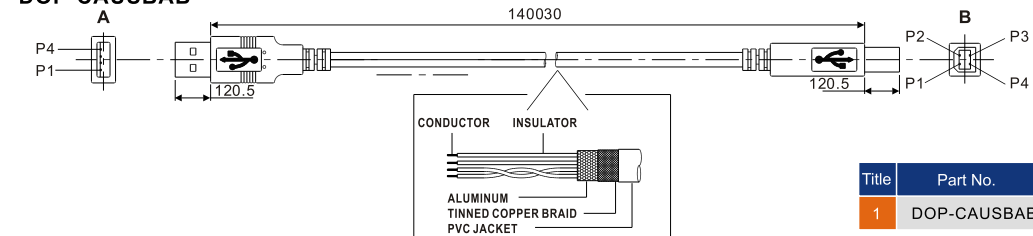
### ASD-CARS0003



Item	Part No.	mm	inch
1	ASD-CARS0003	3000±100	118±4

## Communication Cable between Drive and Computer (for PC)

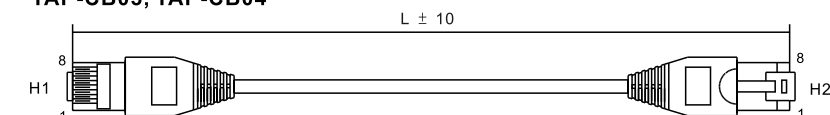
### DOP-CAUSBAB



Item	Part No.	mm	L	inch
1	DOP-CAUSBAB	1400±30		55±1.2

## CANopen Communication Cable

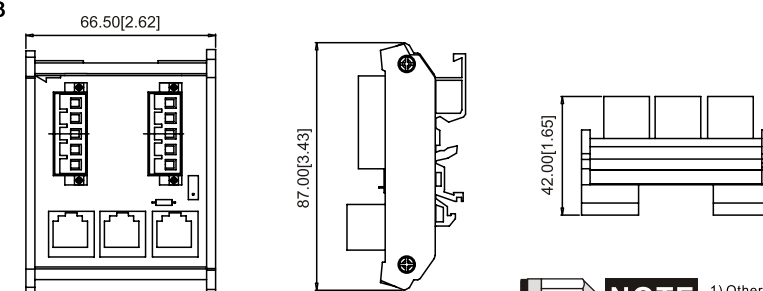
### TAP-CB03, TAP-CB04



Item	Part No.	mm	L	inch
1	TAP-CB03	500±10		19±0.4
2	TAP-CB04	1000±10		39±0.4

## CANopen Distribution Box

### TAP-CN03



**NOTE** 1) Other accessories for ASDA-A2 series will be increased gradually.  
2) Accessories images shown here may differ from actual product appearance. Please refer to the actual product appearance.



# ASDA-A2 Optional Accessories

# ASDA-A2

## Servo Drive, Servo Motor and Accessories Combinations

### 200W Servo Drive and 200W Low Inertia Servo Motor

Servo Drive	ASD-A2-0221-□			
Servo Motor	ECMA-C10602□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-ABPW0003	Power Cables ASD-ABPW0005	Power Cables ASD-ABPW0103	Power Cables ASD-ABPW0105
	Encoder Cables ASD-ABEN0003	Encoder Cables ASD-ABEN0005	Encoder Cables ASD-ABEN0003	Encoder Cables ASD-ABEN0005
Connector	Power Connectors ASDBCAPW0000		Power Connectors ASDBCAPW0100	
	Encoder Cables ASD-ABEN0000			

### 400W Servo Drive and 400W Low Inertia Servo Moto

Servo Drive	ASD-A2-0421-□			
Servo Motor	ECMA-C10604□S ECMA-C10804□7			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-ABPW0003	Power Cables ASD-ABPW0005	Power Cables ASD-ABPW0103	Power Cables ASD-ABPW0105
	Encoder Cables ASD-ABEN0003	Encoder Cables ASD-ABEN0005	Encoder Cables ASD-ABEN0003	Encoder Cables ASD-ABEN0005
Connector	Power Connectors ASDBCAPW0000		Power Connectors ASDBCAPW0100	
	Encoder Cables ASD-ABEN0000			

### 400W Servo Drive and 500W Medium Inertia Servo Motor

Servo Drive	ASD-A2-0421-□			
Servo Motor	ECMA-E11305□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-CAPW1003	Power Cables ASD-CAPW1005	Power Cables ASD-CAPW1103	Power Cables ASD-CAPW1105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW1000			
	Encoder Cables ASD-CAEN1000			

### 400W Servo Drive and 300W High Inertia Servo Motor

Servo Drive	ASD-A2-0421-□			
Servo Motor	ECMA-G11303□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-CAPW1003	Power Cables ASD-CAPW1005	Power Cables ASD-CAPW1103	Power Cables ASD-CAPW1105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW1000			
	Encoder Cables ASD-CAEN1000			

### 750W Servo Drive and 750W Low Inertia Servo Motor

Servo Drive	ASD-A2-0721-□			
Servo Motor	ECMA-C10807□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-ABPW0003	Power Cables ASD-ABPW0005	Power Cables ASD-ABPW0103	Power Cables ASD-ABPW0105
	Encoder Cables ASD-ABEN0003	Encoder Cables ASD-ABEN0005	Encoder Cables ASD-ABEN0003	Encoder Cables ASD-ABEN0005
Connector	Power Connectors ASDBCAPW0000		Power Connectors ASDBCAPW0100	
	Encoder Cables ASD-ABEN0000			

### 750W Servo Drive and 600W High Inertia Servo Motor

Servo Drive	ASD-A2-0721-□			
Servo Motor	ECMA-G11306□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-CAPW1003	Power Cables ASD-CAPW1005	Power Cables ASD-CAPW1103	Power Cables ASD-CAPW1105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW1000			
	Encoder Cables ASD-CAEN1000			



# ASDA-A2 Optional Accessories



## Servo Drive, Servo Motor and Accessories Combinations

### 1kW Servo Drive and 1kW Low Inertia Servo Motor

Servo Drive	ASD-A2-1021-□			
Servo Motor	ECMA-C11010□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-CAPW1003	Power Cables ASD-CAPW1005	Power Cables ASD-CAPW1103	Power Cables ASD-CAPW1105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW1000			
	Encoder Cables ASD-CAEN1000			

### 1kW Servo Drive and 1kW Medium Inertia Servo Motor

Servo Drive	ASD-A2-1021-□			
Servo Motor	ECMA-E11310□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-CAPW1003	Power Cables ASD-CAPW1005	Power Cables ASD-CAPW1103	Power Cables ASD-CAPW1105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW1000			
	Encoder Cables ASD-CAEN1000			

### 1kW Servo Drive and 900W High Inertia Servo Motor

Servo Drive	ASD-A2-1021-□			
Servo Motor	ECMA-G11309□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-CAPW1003	Power Cables ASD-CAPW1005	Power Cables ASD-CAPW1103	Power Cables ASD-CAPW1105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW1000			
	Encoder Cables ASD-CAEN1000			

### 1.5kW Servo Drive and 1.5kW Medium Inertia Servo Motor

Servo Drive	ASD-A2-1521-□			
Servo Motor	ECMA-E11315□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-CAPW1003	Power Cables ASD-CAPW1005	Power Cables ASD-CAPW1103	Power Cables ASD-CAPW1105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW1000			
	Encoder Cables ASD-CAEN1000			

### 2kW Servo Drive and 2kW Low Inertia Servo Motor

Servo Drive	ASD-A2-2023-□			
Servo Motor	ECMA-C11020□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-A2PW1003	Power Cables ASD-A2PW1005	Power Cables ASD-A2PW1103	Power Cables ASD-A2PW1105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW1000			
	Encoder Cables ASD-CAEN1000			

### 2kW Servo Drive and 2kW Medium Inertia Servo Motor

Servo Drive	ASD-A2-2023-□			
Servo Motor	ECMA-E11320□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-A2PW1003	Power Cables ASD-A2PW1005	Power Cables ASD-A2PW1103	Power Cables ASD-A2PW1105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW1000			
	Encoder Cables ASD-CAEN1000			

### ASDA-A2 Servo Drive and 2kW High Inertia Servo Motor

Servo Drive	ASD-A2-2023-□			
Servo Motor	ECMA-E11820□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-CAPW2003	Power Cables ASD-CAPW2005	Power Cables ASD-CAPW2103	Power Cables ASD-CAPW2105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW2000			
	Encoder Cables ASD-CAEN1000			



# ASDA-A2 Safety Information

# ASDA-A2

## Servo Drive, Servo Motor and Accessories Combinations

### 3kW Servo Drive and 3kW Medium Inertia Servo Motor

Servo Drive	ASD-A2-3023-□			
Servo Motor	ECMA-E11830□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-CAPW2003	Power Cables ASD-CAPW2005	Power Cables ASD-CAPW2103	Power Cables ASD-CAPW2105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW2000			
	Encoder Cables ASD-CAEN1000			

### 3kW Servo Drive and 3kW Medium-High Inertia Servo Motor

Servo Drive	ASD-A2-3023-□			
Servo Motor	ECMA-F11830□S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
	Power Cables ASD-CAPW2003	Power Cables ASD-CAPW2005	Power Cables ASD-CAPW2103	Power Cables ASD-CAPW2105
	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005	Encoder Cables ASD-CAEN1003	Encoder Cables ASD-CAEN1005
Connector	Power Connectors ASD-CAPW2000			
	Encoder Cables ASD-CAEN1000			

Other Accessories (for ASDA-A2 series all models)	
Description	Delta Part Number
50Pin I/O signal connector (CN1)	ASD-CNSC0050
Terminal Block Module	ASD-BM-50A
RS-232 Communication Cable	ASD-CARS0003
Communication Cable between Drive and Computer (for PC)	DOP-CAUSBAB
CANopen Communication Cable	TAP-CB03/TAP-CB04
CANopen Distribution Box	TAP-CN03
Regenerative Resistor 400W 40Ω	BR400W040
Regenerative Resistor 1kW 20Ω	BR1K0W020

## Regenerative Resistor Specifications

Servo Drive (kW)	Recommended Specifications for Built-in Regenerative Resistor		Recommended Specifications for External Regenerative Resistor	Min. Allowable Resistance (Ohm)
	Resistance (Ohm) (parameter P1-52)	Capacity (Watt) (parameter P1-53)		
0.2	-	-	50Ω	40Ω
0.4	-	-	40Ω	30Ω
0.75	40Ω	60W	30Ω	20Ω
1.0	40Ω	60W	30Ω	20Ω
1.5	40Ω	60W	30Ω	20Ω
2.0	20Ω	100W	30Ω	20Ω
3.0	20Ω	100W	15Ω	10Ω

- Note:
- 1) There is no built-in regenerative resistor for 400W and below ASDA-A2 series servo drive.
  - 2) When the fault, ALE05 (Regeneration Error) occurs, please increase the regenerative resistor capacity or decrease the regenerative resistor resistance (the regenerative resistor resistance should not be less than the minimum allowable resistance listed in the above table).
  - 3) If the situation could not be improved after increasing the regenerative resistor capacity or decreasing the regenerative resistor resistance, please purchase regenerative resistor module.
  - 4) When combining multiple small-capacity regenerative resistors in parallel to increase the regenerative resistor capacity, make sure that the total resistance value of the regenerative resistors should not be less than the minimum allowable resistance listed in the above table.

## Safety Information

Global Standards	ASDA-A2 series is designed to fully comply with demanding international standards, i.e. IEC and EN, etc. for all fields of industrial automation technology.
EMS standard	EN61000-4-6 Level 3
	EN61000-4-3 Level 3
	EN61000-4-2 Level 2 and Level 3
	EN61000-4-4 Level 3
	EN61000-4-8 Level 4
Conducted & Radiated Emissions	EN61000-4-5 Level 3
	Complies with EN550011 Class A Group 1, with external EMC filter
CE Marking	CE recognized. Complies with Directive 2006/95/EC of the European Parliament and EMC Directive 2004/108/EC.
UL Approval	UL (U.S.), cUL (Canada) recognized.
Test Standard	IEC/EN50178, IEC/EN60529
	IP20
Vibration	1G less than 20Hz, 0.6G 20 to 50Hz. Complies with IEC/EN50178
Shock	15gn 11ms. Complies with IEC/EN600028-2-27
Pollution Degree	Degree 2. Complies with IEC/EN61800-5-1