



DELTA ELECTRONICS, INC.

[www.delta.com.tw/industrialautomation](http://www.delta.com.tw/industrialautomation)

### **IABU Headquarters**

**Delta Electronics, Inc.**

Taoyuan1

31-1, Xingbang Road, Guishan Industrial Zone,  
Taoyuan County 33370, Taiwan, R.O.C.  
TEL: 886-3-362-6301 / FAX: 886-3-362-7267

### **Asia**

**Delta Electronics (Jiang Su) Ltd.**

Wujiang Plant3

1688 Jiangxing East Road,  
Wujiang Economy Development Zone,  
Wujiang City, Jiang Su Province,  
People's Republic of China (Post code: 215200)  
TEL: 86-512-6340-3008 / FAX: 86-512-6340-7290

**Delta Greentech (China) Co., Ltd.**

238 Min-Xia Road, Cao-Lu Industry Zone, Pudong, Shanghai,  
People's Republic of China  
Post code : 201209  
TEL: 021-58635678 / FAX: 021-58630003

**Delta Electronics (Japan), Inc.**

Tokyo Office

Delta Shibadaimon Building, 2-1-14  
Shibadaimon, Minato-Ku, Tokyo, 105-0012,  
Japan  
TEL: 81-3-5733-1111 / FAX: 81-3-5733-1211

**Delta Electronics (Korea), Inc.**

234-9, Duck Soo Building 7F, Nonhyun-Dong,  
Kangnam-Gu, Seoul, Korea 135-010  
TEL: 82-2-515-5305 / FAX: 82-2-515-5302

**Delta Electronics (Singapore) Pte. Ltd.**

8 Kaki Bukit Road 2, #04-18 Ruby Warehouse Complex,  
Singapore 417841  
TEL: 65-6747-5155 / FAX: 65-6744-9228

**Delta Electronics (India) Pvt. Ltd.**

Plot No. 43, Sector - 35, HSIIDC,  
Gurgaon122001, Haryana, India  
TEL: 91-124-416-9040 / FAX: 91-124-403-6045

### **America**

**Delta Products Corporation (USA)**

Raleigh Office

P.O. Box 12173, 5101 Davis Drive,  
Research Triangle Park, NC 27709, U.S.A.  
TEL: 1-919-767-3813 / FAX: 1-919-767-3969

**Delta Greentech (Brasil) S/A**

Sao Paulo Office

Rua Itapeva, N° 26, 3° andar, Bela vista  
ZIP: 01332-000 - São Paulo - SP - Brasil  
TEL : 55-11-3568-3875 / FAX : 55-11-3568-3865

### **Europe**

**Deltronics (The Netherlands) B.V.**

Eindhoven Office

De Witbogt 15, 5652 AG Eindhoven, The Netherlands  
TEL: 31-40-2592850 / FAX: 31-40-2592851

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



# ASDA-A+

## DELTA ASDA-A+ AC Servo System



ASDA-A+

# AC Servo System

# ASDA-A+

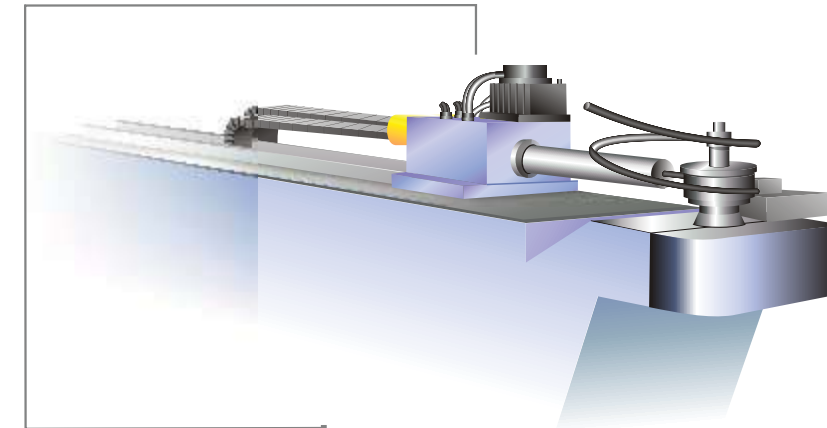
## Applications



Motion



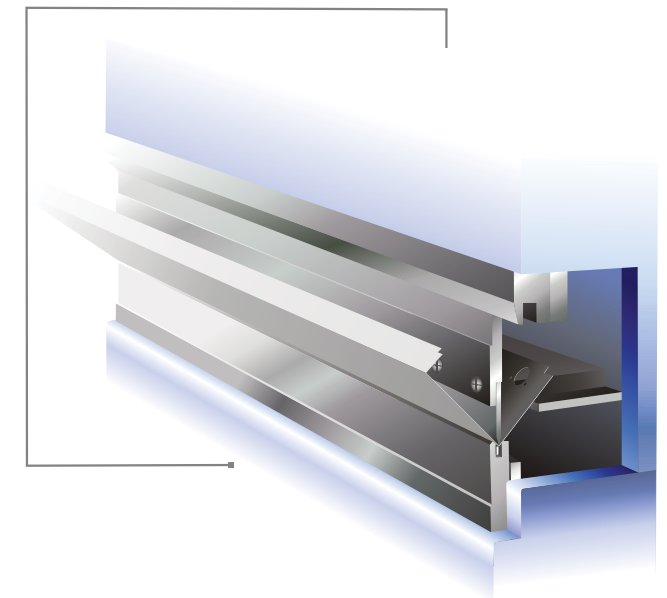
**ASDA-A+** series features encoder with 20-bit resolution (1,280,000p/rev), which perfectly offers more accurate control for the machine tool industry (e.g. the spindle in CNC machine tool, carving machine, injection molding machine, double column type machining center) requiring highly accurate processing. In addition, for equipment requiring high torque output (e.g. winding machine, tube bending machine, packaging and feeding machine), ASDA-A+ series offers high torque from 3kW to 7.5kW (19.1 N.M. ~ 47.74 N.M.).



**In Tube Bending Machine**  
In controlling the tube bending, ASDA-A+ series is able to operate stably at high-speed, conduct highly accurate positioning and extend the life of the machine.

### In Bending Machine

ASDA-A+ series is able to offer accurate in-dept control and high stability, which not only reduces the low yield in the cutting but also enhances the safety and productivity. Beside, ASDA-A+ series also equals energy-saving, low power consumption and high efficiency.



### In Spring Machine

ASDA-A+ series used for driving will not be restricted by the cam of the machine but can conduct processing in different directions for achieving complicated molding. The shortened installation time can further enhance the productivity, and the high resolution is able to ensure the high accuracy.



# AC Servo System

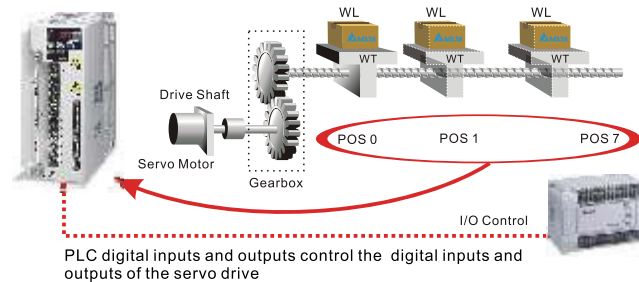
# ASDA-A+

## 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)

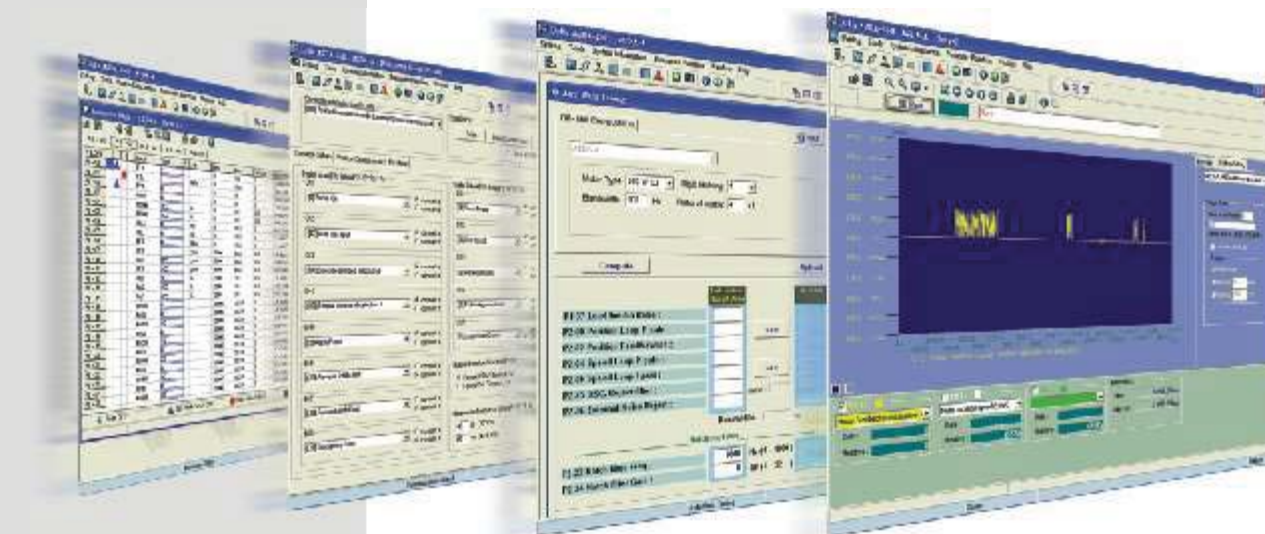
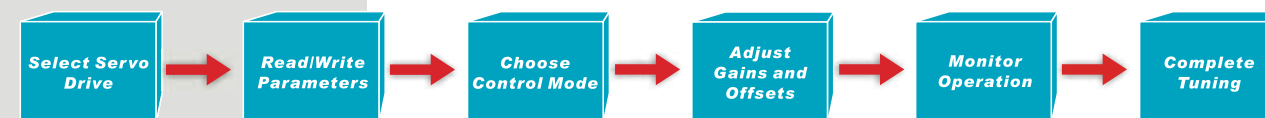


### Excellent Performance

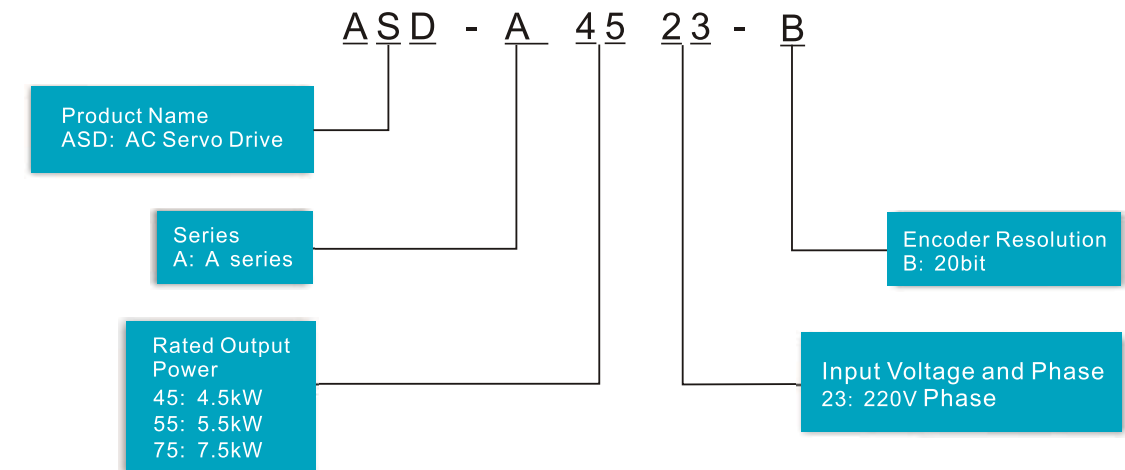
- ◆ Motor settling time below 1msec
- ◆ Speed responsiveness characteristic: 550Hz
- ◆ Great stability and performance at low speed: less than 0.5% error at 1rpm per rotation

### ASDA-Soft Servo Software

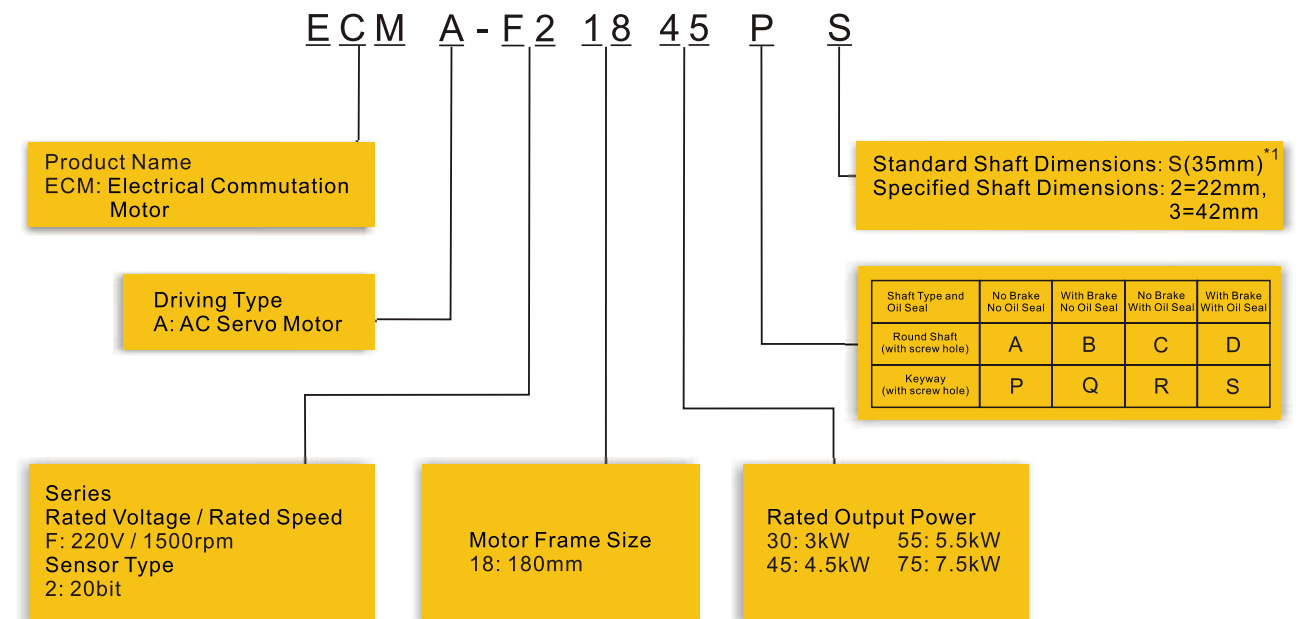
New version of ASDA-A-Soft servo software has a better interface and is built-in with more functions, greatly enhancing the handiness of the software and considerably shortening the time for the users to get used to ASDA-Soft.



### Servo Drive ASDA-A+ Series



### Servo Motor ECMA Series



Servo Drive		Connectable Servo Motor
Power	Model Name	
4.5kW	ASD-A4523-B	ECMA-F21830□ S(3kW) <sup>*2</sup> 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)

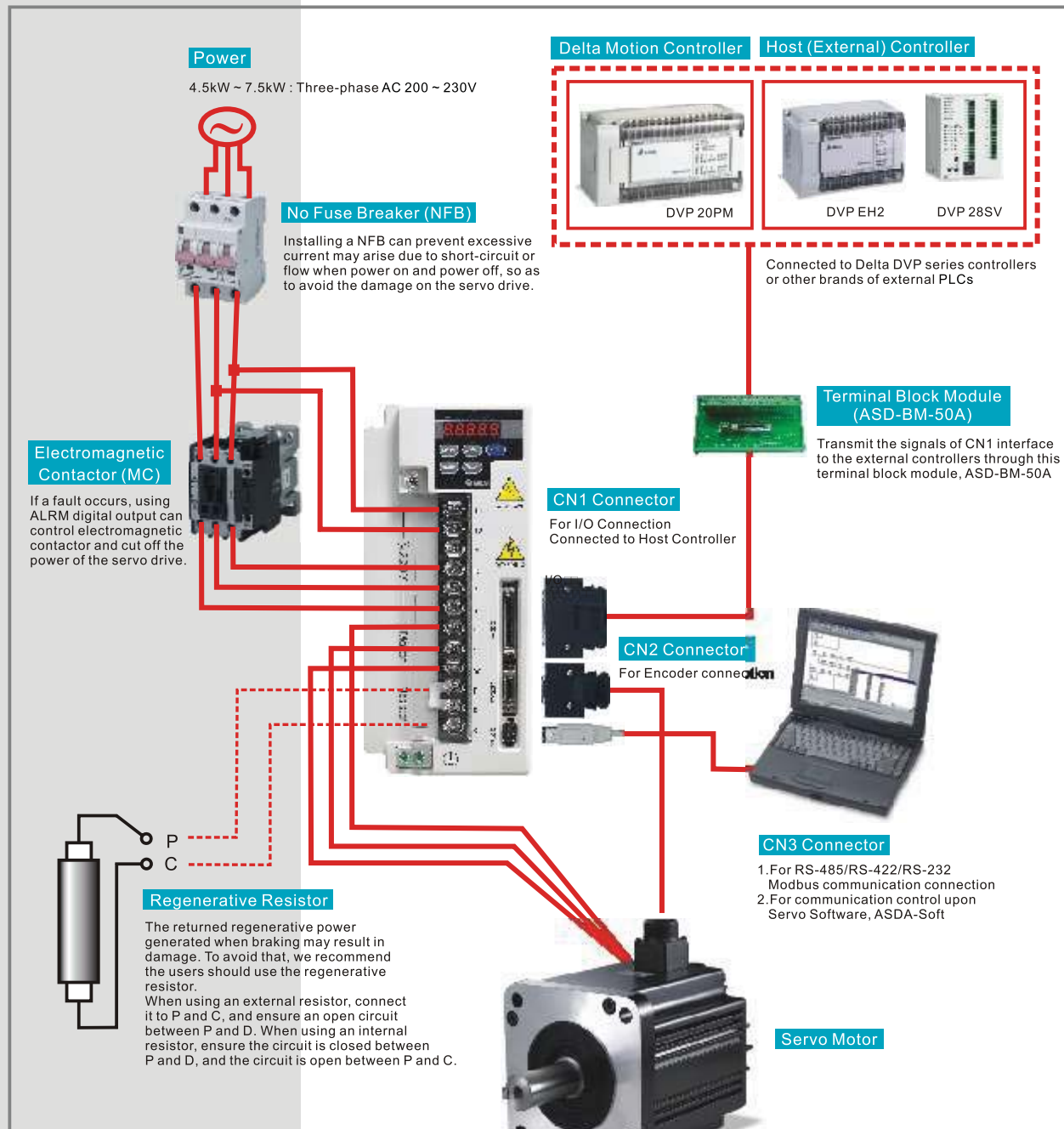
\*1. For the detailed dimensions explanation, please refer to "Medium and High Inertia Servo Motor Dimensions (ECMA Series)" on page 15.  
\*2. The boxes(□) in the model names are for optional configurations (brake, shaft type and oil seal).

# AC Servo System

## System Configuration and Standard Connections

# ASDA-A+

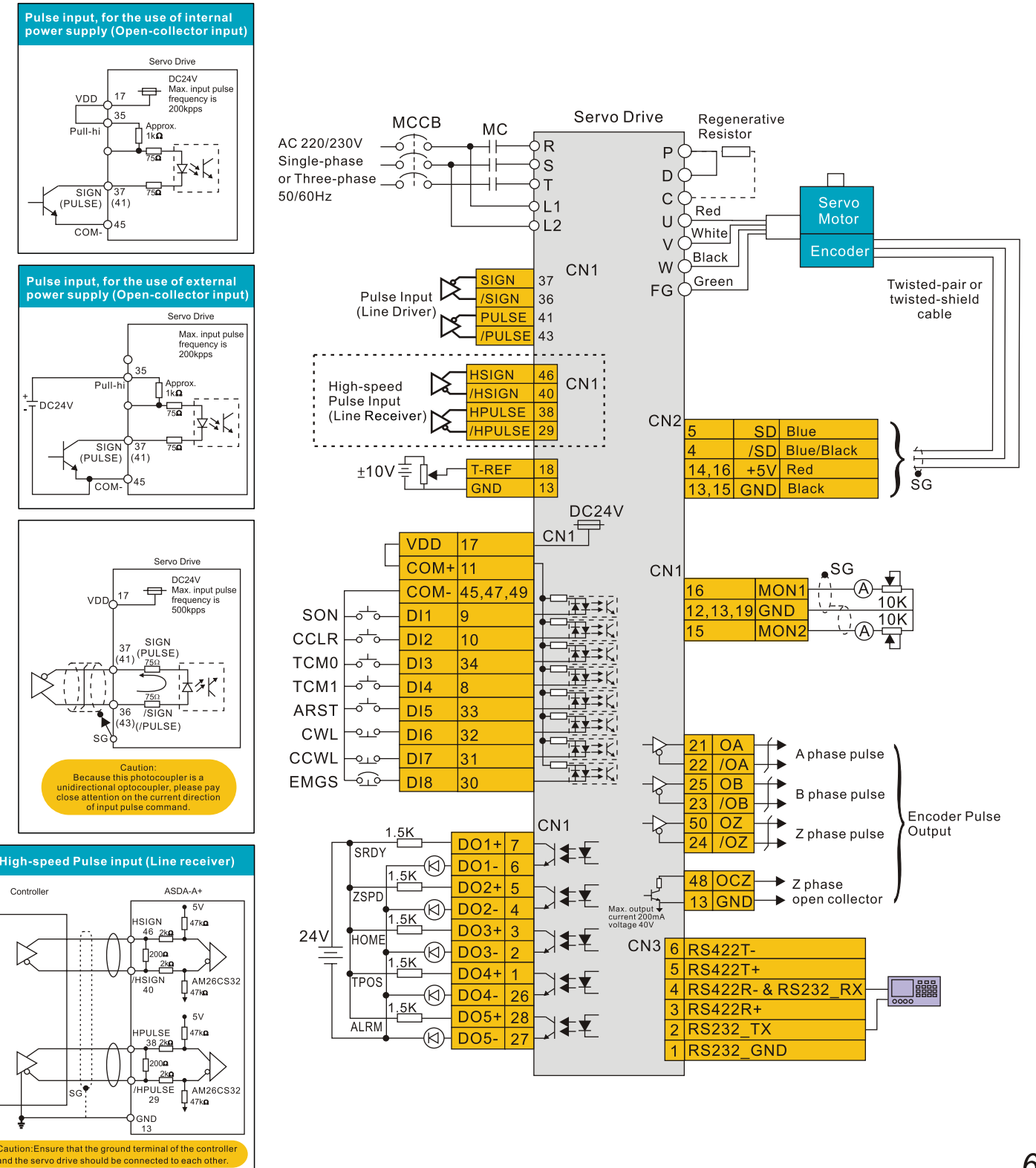
### System Configuration



**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.

### Position (Pt) Control Mode



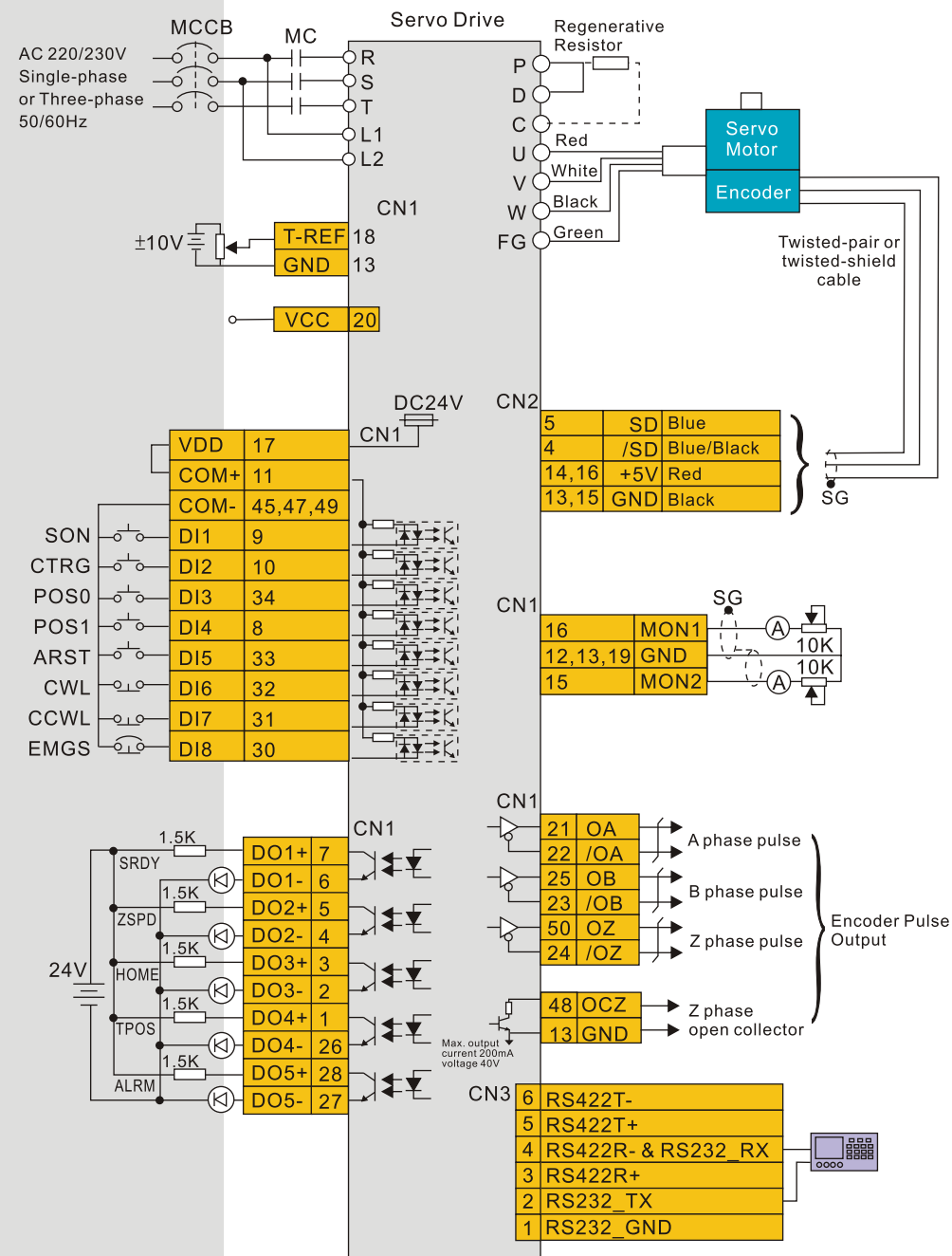


# AC Servo System

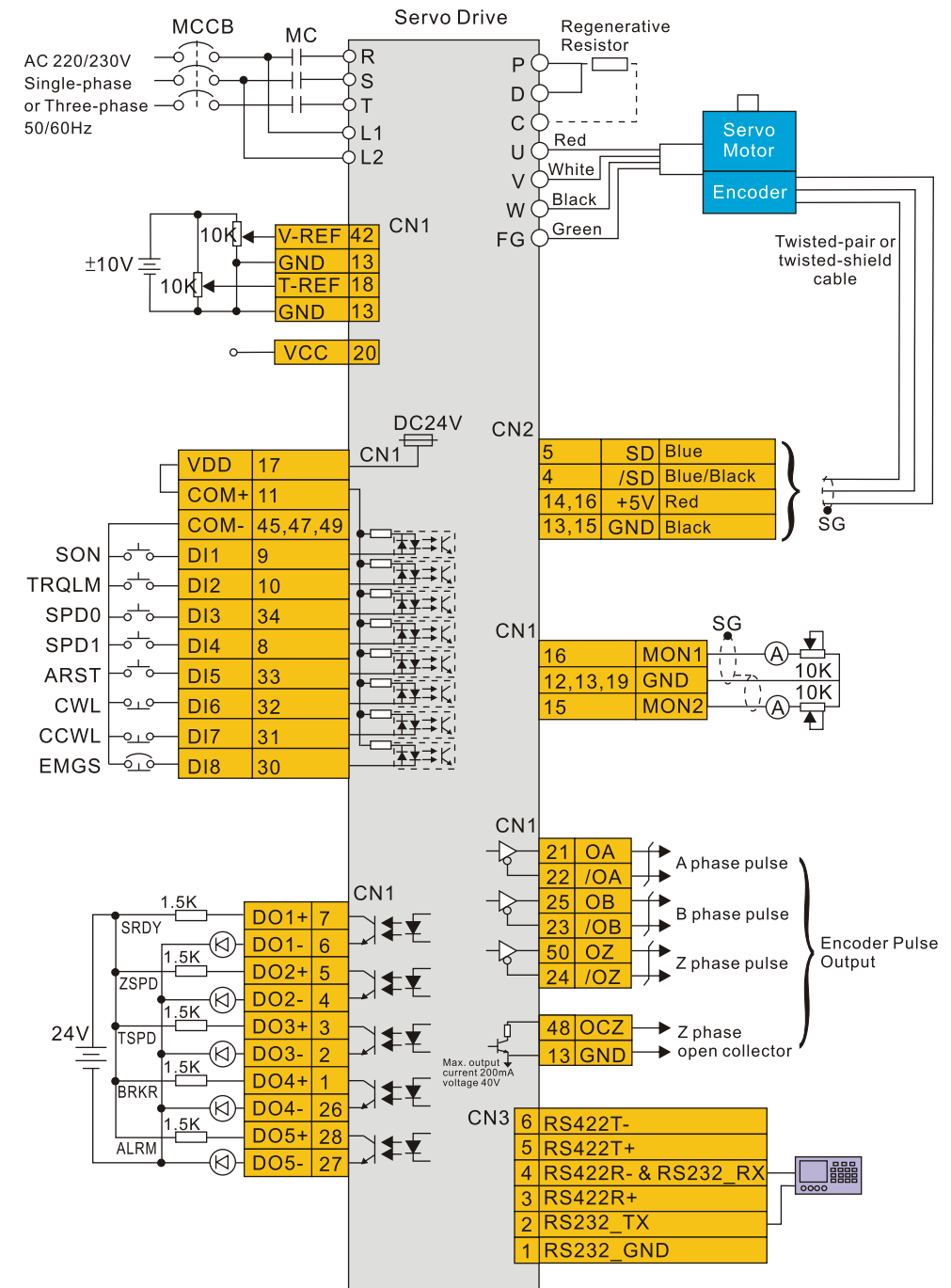
## Standard Connections

# ASDA-A+

### Position (Pr) Control Mode



### Speed (S) Control Mode

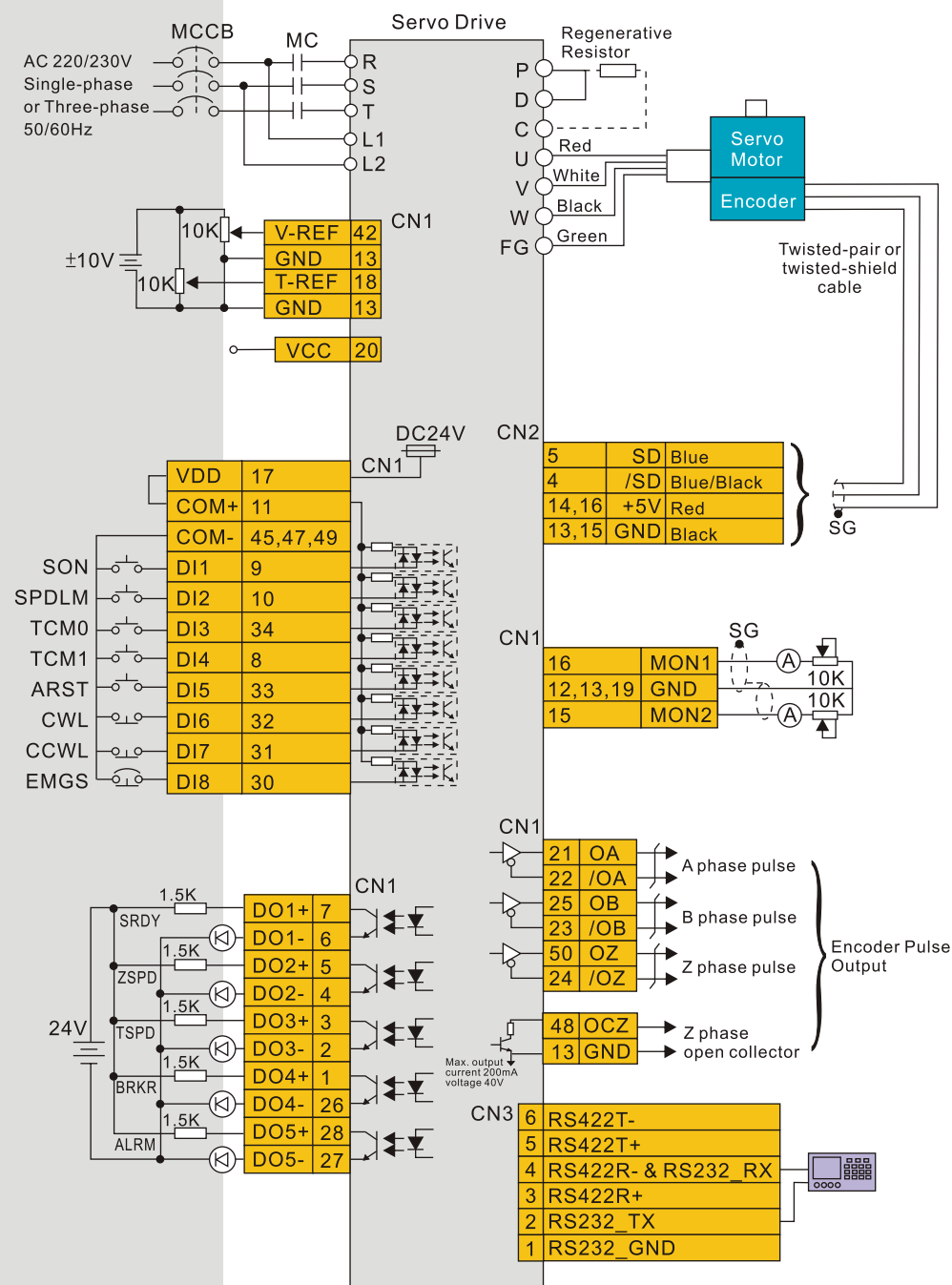


# AC Servo System

## Standard Connections and Specifications



### Torque (T) Control Mode



### Servo Drive Specifications (ASDA-A+ Series)

ASDA-A+-B Series		4.5kW	5.5kW	7.5kW
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		
Speed Control Mode	Feed Forward Compensation	Set by parameters		
	Analog Input Command	Voltage Range	0 ~ ±10 V <sub>DC</sub>	
		Input Resistance	10K	
		Time Constant	2.2 s	
	Speed Control Range <sup>1</sup>	1:3000		
	Command Source	External analog signal / Internal parameters		
Torque Control Mode	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		
Analog Monitor Output	Analog Input Command	Voltage Range	0 ~ ±10 V <sub>DC</sub>	
		Input Resistance	10K Ω	
		Time Constant	2.2 μs	
Digital Input/Output	Command Source	External analog signal / Internal parameters		
	Smoothing Strategy	Low-pass filter		
	Speed Limit Operation	Parameter Setting or via Analog input		
Protective Functions		Monitor signal can set by parameters (Output voltage range: ±8V)		
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 <sup>2</sup> (1G) less than 20Hz, 5.88m/s <sup>2</sup> (0.6G) 20 to 50Hz		
IP Rating	IP20			
Power System	TN System <sup>3</sup>			
Approvals	IEC / EN 61800-5-1			

\*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)

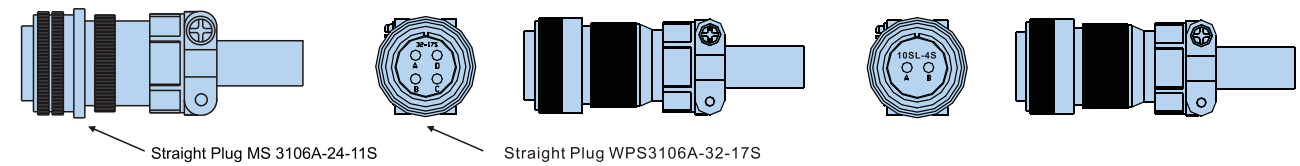
Model: ECMA Series	F218			
	30	45	55	75
Rated output power (kW)	3.0	4.5	5.5	7.5
Rated torque (N-m)	19.10	28.65	35.01	47.74
Maximum torque (N-m)	57.29	71.62	87.53	119.36
Rated speed (r/min)	1500			
Maximum speed (r/min)	3000			
Rated current (A)	19.4	32.5	40.0	47.5
Maximum current (A)	58.2	81.3	100.0	118.8
Power rating (kW/s)	66.4	105.5	122.9	159.7
Rotor moment of inertia (kg.m <sup>2</sup> )	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 <sup>2</sup> )(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 consumption (at 20°C) [W]	20.4			
Brake release time [ms (Max)]	10			
Brake pull-in 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			

## Power Connector

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

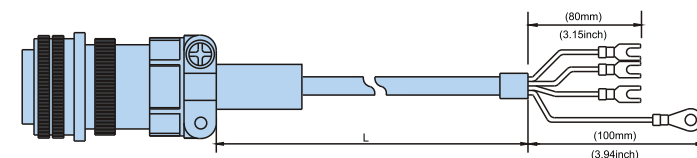
**ASD-CAPW4000**  
(for models of 5.5kW and above)  
CLAMP : WPS3057-20A

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



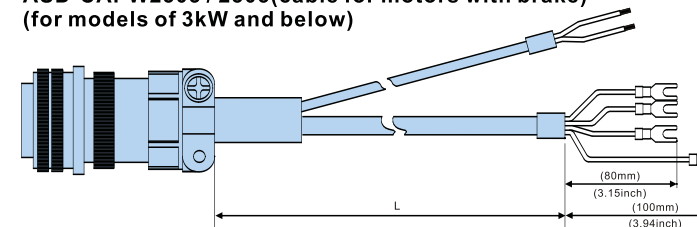
## Power Cable

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



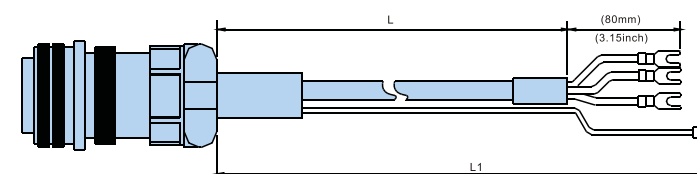
Item	Part No.	Straight	L	
			mm	inc.
1	ASD-CAPW2203	MS 3106A-24-11S	3000 ± 100	118 ± 4
2	ASD-CAPW2205	MS 3106A-24-11S	5000 ± 100	197 ± 4

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



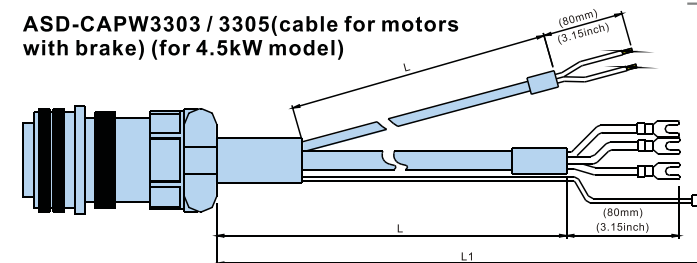
Item	Part No.	Straight	L	
			mm	inc.
1	ASD-CAPW2303	MS 3106A-24-11S	3000 ± 100	118 ± 4
2	ASD-CAPW2305	MS 3106A-24-11S	5000 ± 100	197 ± 4

**ASD-CAPW3203/3205 (for 4.5kW model)**



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

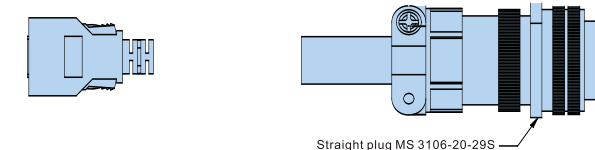
**ASD-CAPW3303 / 3305 (cable for motors with brake)**  
(for 4.5kW model)



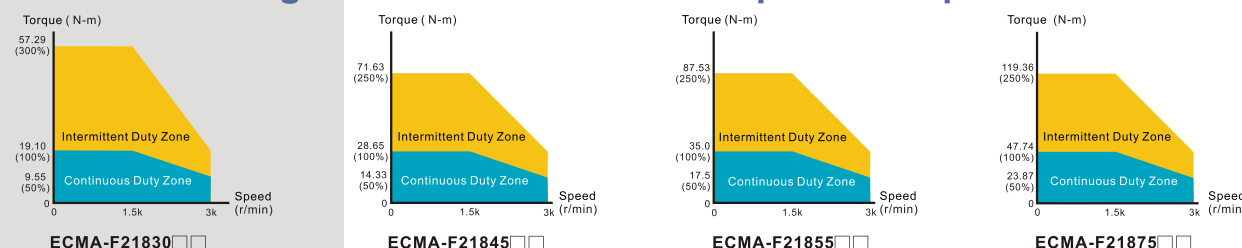
Item	Part No.	Straight	L		L1	
			mm	inc.	mm	inc.
1	ASD-CAPW3303	MS 3106A-24-11S	3000 ± 100	118 ± 0.4	3100 ± 100	122 ± 0.4
2	ASD-CAPW3305	MS 3106A-24-11S	5000 ± 100	197 ± 0.4	5100 ± 100	201 ± 0.4

## Encoder Connector

**ASD-CAEN1000**



## Medium and High Inertial Servo Motor Speed-Torque Curves





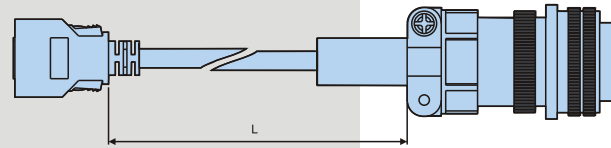
# AC Servo System

# ASDA-A+

## Accessories

### Encoder Cable

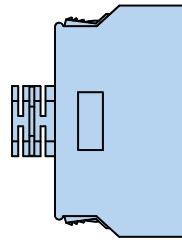
ASD-CAEN1003 / 1005



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

### I/O Signal Connector

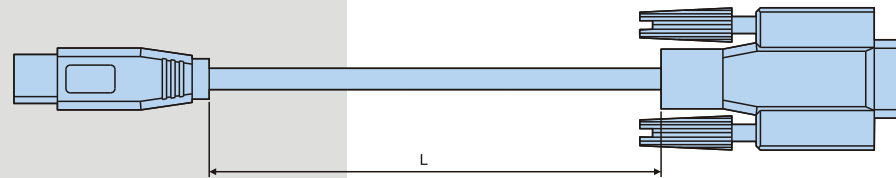
ASD-CNSC0050



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

### Communication Cable( for PC)

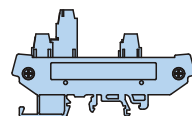
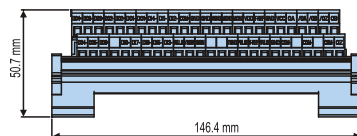
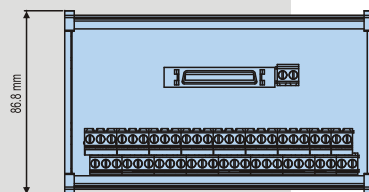
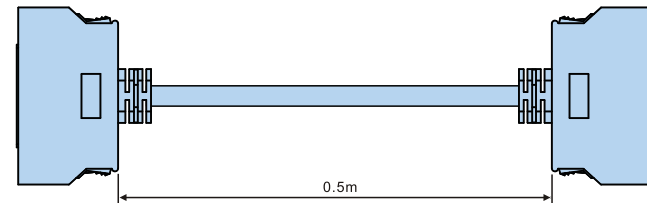
ASD-CARS0003



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

### Terminal Block

ASD-BM-50A



### 4.5kW Servo Drive and 3.5kW Medium Inertia Servo Motor

Servo Drive	ASD-A4523-B			
Servo Motor	ECMA-F21830 □ S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
Motor Power Cable	ASD-CAPW2203	ASD-CAPW2205	ASD-CAPW2303	ASD-CAPW2305
Encoder Cable	ASD-CAEN1003	ASD-CAEN1005	ASD-CAEN1003	ASD-CAEN1005
Connector	Power Connector ASD-CAPW2000			
	Encoder Connector ASD-CAEN1000			

### 4.5kW Servo Drive and 4.5kW Medium-High Inertia Servo Motor

Servo Drive	ASD-A4523-B			
Servo Motor	ECMA-F21845 □ S			
Cable	Without Brake		With Brake	
	3M	5M	3M	5M
Motor Power Cable	ASD-CAPW3203	ASD-CAPW3205	ASD-CAPW3303	ASD-CAPW3305
Encoder Cable	ASD-CAEN1003	ASD-CAEN1005	ASD-CAEN1003	ASD-CAEN1005
Connector	Power Connector ASD-CAPW2000			
	Encoder Connector ASD-CAEN1000			

### 5.5kW Servo Drive and 5.5kW Medium-High Inertia Servo Motor

Servo Drive	ASD-A5523-B	
Servo Motor	ECMA-F21855 □ 3	
Cable	Encoder Cable ASD-CAEN1003	Encoder Cable ASD-CAEN1005
Connector	Power Connector ASD-CAPW4000	
	Encoder Connector ASD-CAEN1000	
	Brake Connector ASD-CNBR1000	

### 7.5kW Servo Drive and 7.5kW Medium-High Inertia Servo Motor

Servo Drive	ASD-A7523-B	
Servo Motor	ECMA-F21875 □ 3	
Cable	Encoder Cable ASD-CAEN1003	Encoder Cable ASD-CAEN1005
Connector	Power Connector ASD-CAPW4000	
	Encoder Connector ASD-CAEN1000	
	Brake Connector ASD-CNBR1000	

### Regenerative Resistor Specifications

Servo Drive (kW)	Recommended Specifications for Built-in Regenerative Resistor		Recommended Specifications for External Regenerative Resistor	Min. Allowable Resistance (Ohm)
	Resistance (P1-52)	Capacity (P1-53)		
4.5kW	20 Ω	100W	12 Ω 4.5KW	10 Ω
5.5kW	-	-	8 Ω 5.5KW	8 Ω
7.5kW	-	-	8 Ω 7.5KW	8 Ω

Note : 1. When the fault, ALE05 (Regeneration Error) occurs, please increase the regenerative resistor capacity.  
2. 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 be lower than the minimum allowable resistance listed in the above table.

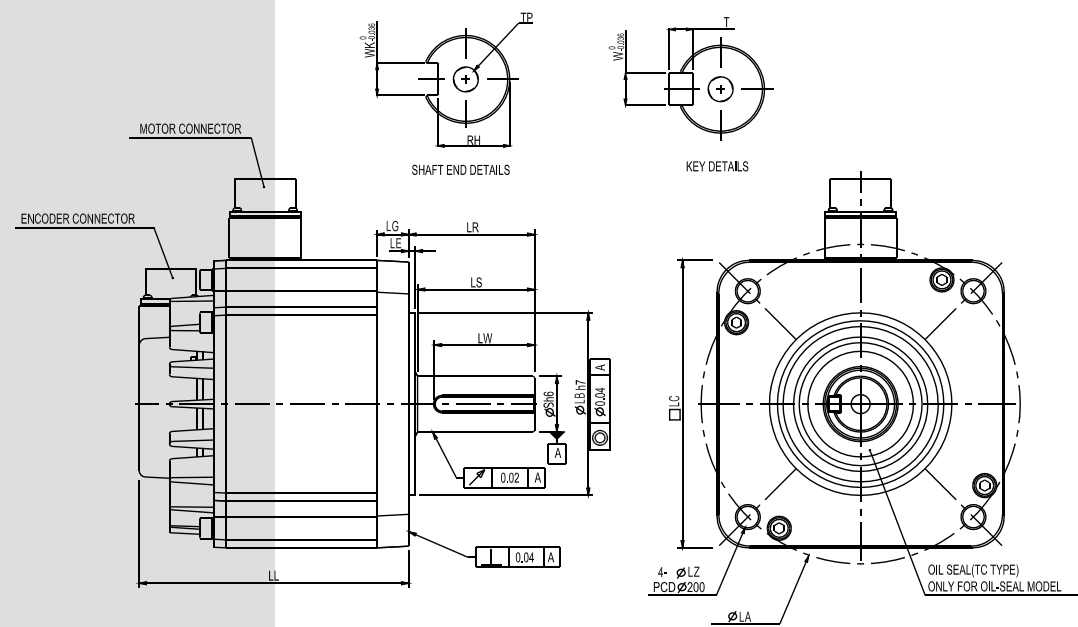


# AC Servo System

# ASDA-A+

## Dimensions

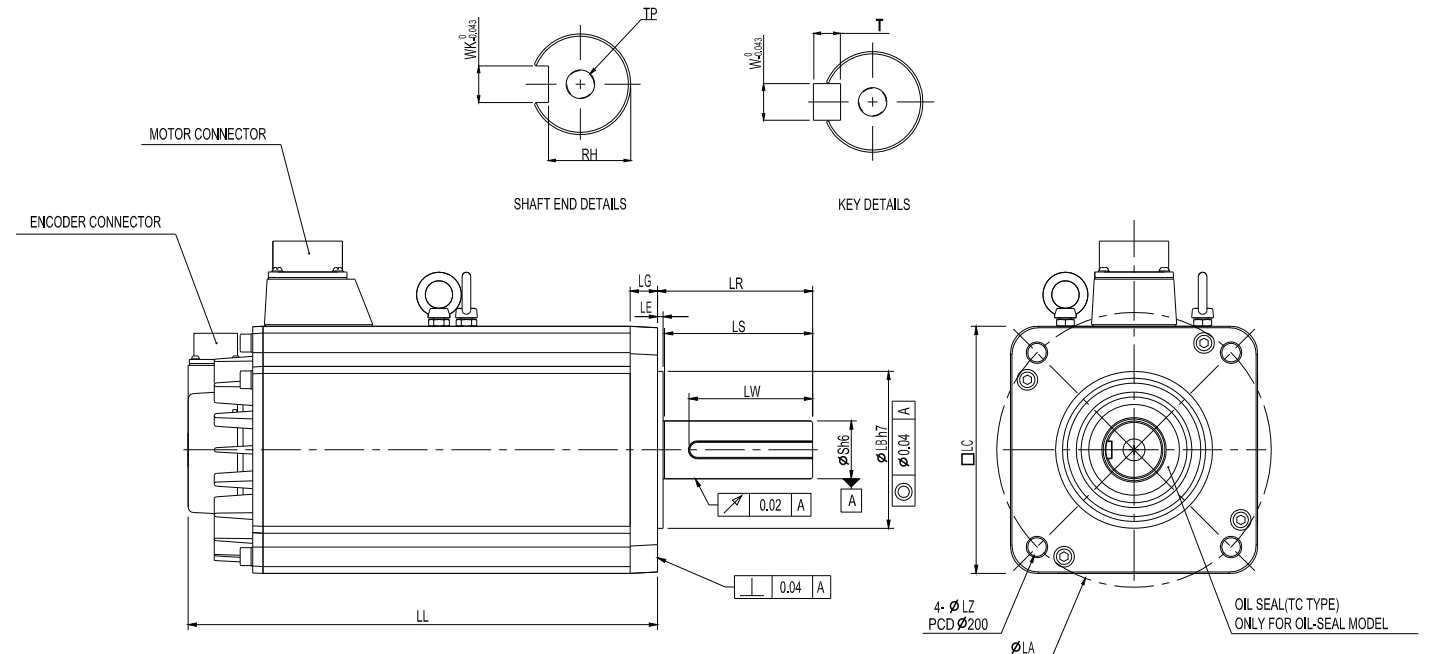
### Medium Inertia Servo Motor Dimensions (ECMA Series)



	ECMA-F21830□S	ECMA-F21845□S
LC	180	180
LZ	13.5	13.5
LA	200	200
S	35	35
LB	114.3	114.3
LL	202.1	235.3
LR	79	79
LE	4	4
LG	20	20
LS	73	73
LW	63	63
RH	30	30
WK	10	10
W	10	10
T	8	8
TP	M12, Depth25	M12, Depth25

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

### Medium and High Inertia Servo Motor Dimensions (ECMA Series)



	ECMA-F21855□S	ECMA-F21875□S
LC	180	180
LZ	13.5	13.5
LA	200	200
S	42	42
LB	114.3	114.3
LL	279.7	342.0
LR	113	113
LE	4	4
LG	20	20
LS	108.5	108.5
LW	90	90
RH	37	37
WK	12	12
W	12	12
T	8	8
TP	M16, Depth32	M16, Depth32

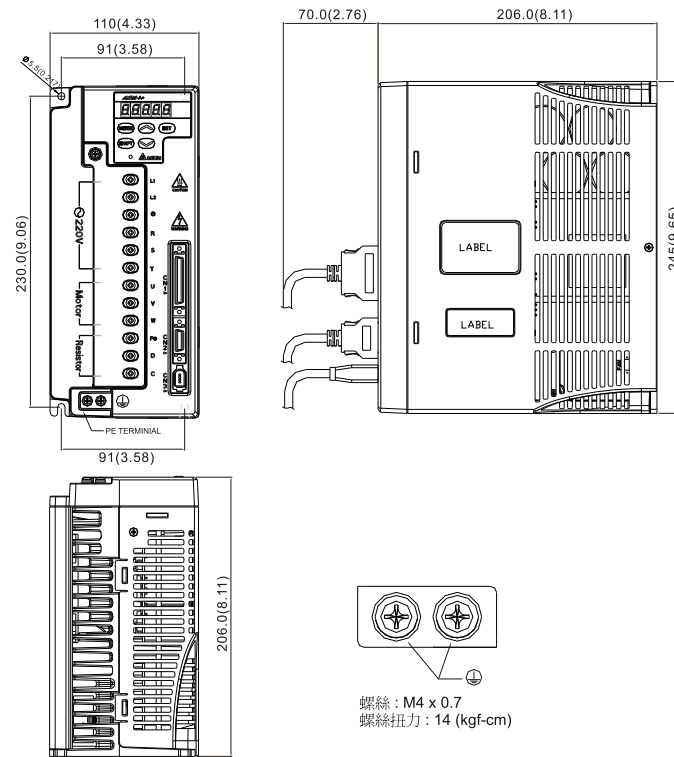
**NOTE** 1) Dimensions are in millimeters ; Weights are in kilograms (kg) and (pounds (lbs)).  
 2) Dimensions and weights of the servo motors may be revised without prior notice.  
 3) The boxes (□) in the model names are for optional configurations (brake, shaft type and oil seal).

# AC Servo System

# ASDA-A+

## Dimensions

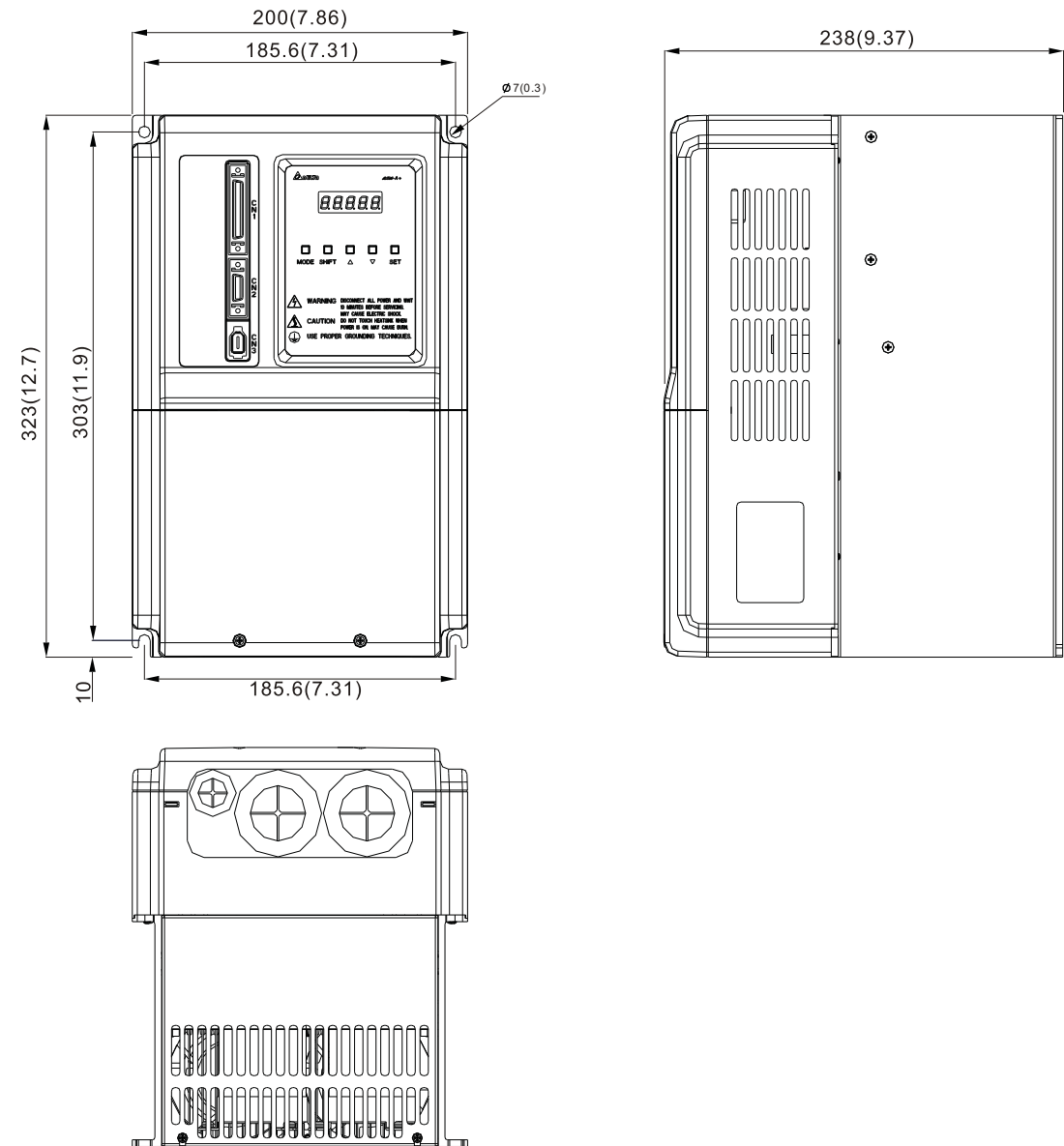
### Servo Drive Dimension (ASDA-A+ Series) ASD-A4523-B (4.5kW)



**Weight**  
3.0 (6.6)

**NOTE** 1) Dimensions are in millimeters (inches);  
Weights are in kilograms (kg) and (pounds (lbs)).  
2) Dimensions and weights of the servo drives may be revised without prior notice.

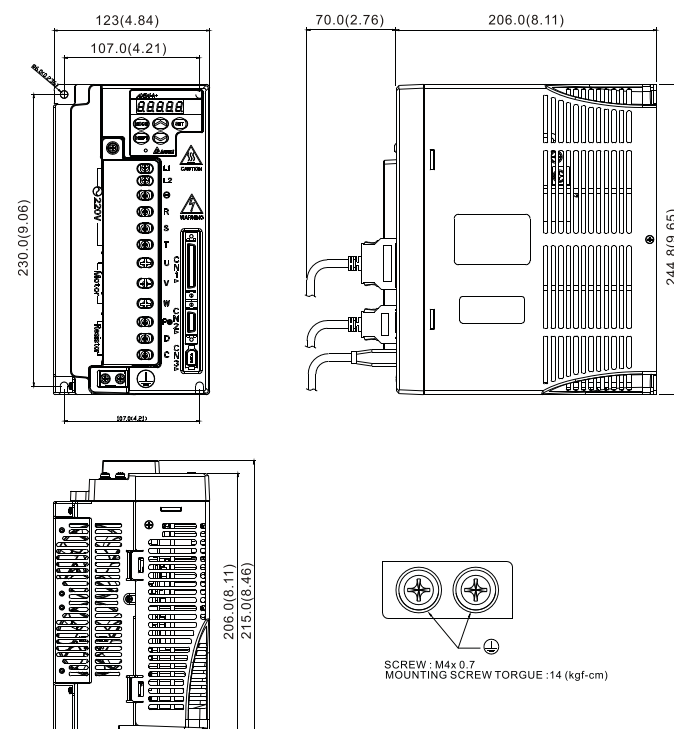
### Servo Drive Dimension (ASDA-A+ Series) ASD-A7523-B (7.5kW)



**Weight**  
8 (17.6)

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

### Servo Drive Dimension (ASDA-A+ Series) ASD-A5523-B (5.5kW)



**Weight**  
5.5 (12)

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