



Automation for a Changing World

Delta AC Servo Drive & Motor ASDA-A3 Series

Delta High-end Servo System ASDA-A3

More Responsive, Better Accuracy and
Remarkable Robust Control





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Cutting-edge Specifications

- 3.1 kHz bandwidth
- 24-bit absolute type encoder
- High speed motor with 6000 r/min and 350 % peak torque
- Motor with high or low inertia rotor
- Low cogging torque motors
- Supports a variety of motors
- Full-closed loop control function



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System Tuning and Safety Functions

- System diagnosis function
- Low frequency vibration suppression function
- Auto-tuning function
- Advanced notch filters
- Safe Torque Off (STO) function



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- Built-in camming functions
- Capture and compare functions



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- Thinner size servo drives
- Smaller size servo motors



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- Graphical interface for parameter settings
- Auto-tuning wizard for gains
- Advanced gain tuning interface
- System analysis in Bode Plot
- Oscilloscope function
- Graphical programming interface of PR mode



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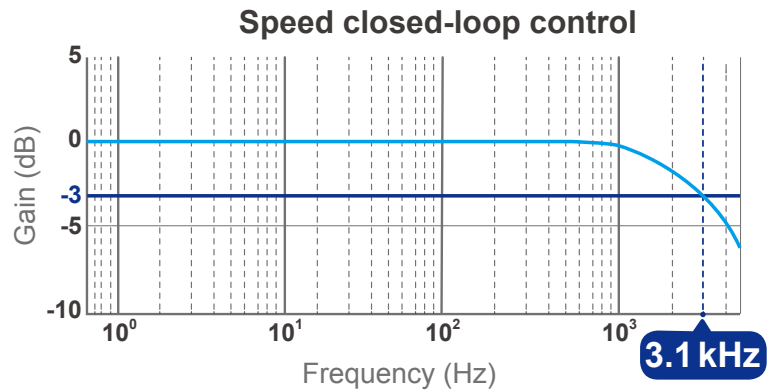
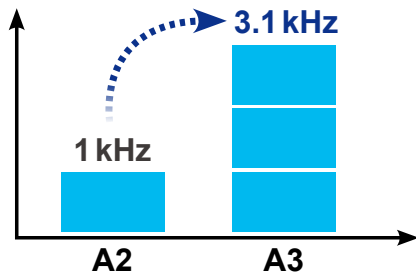
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Cutting-edge Specifications

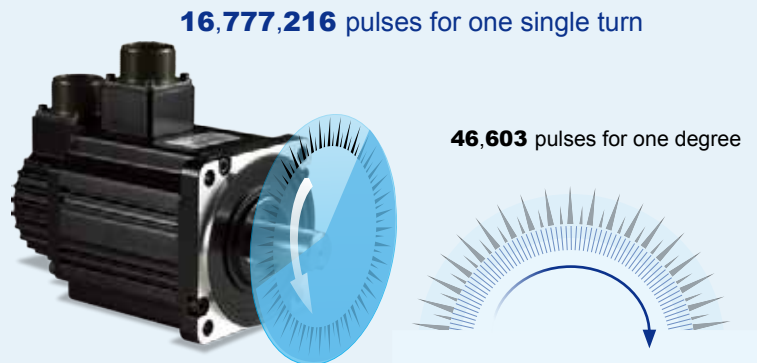
3.1 kHz Bandwidth

- ▶ Higher responsiveness and shorter settling time could increase productivity



24-bit Absolute Type Encoder

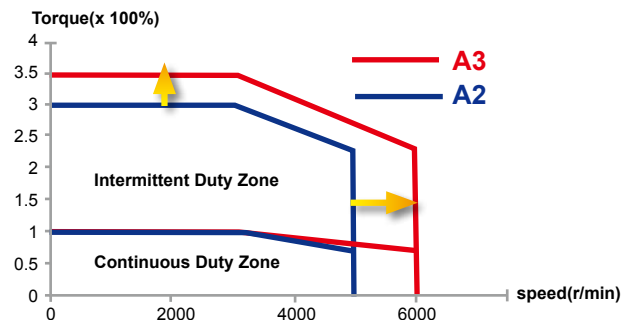
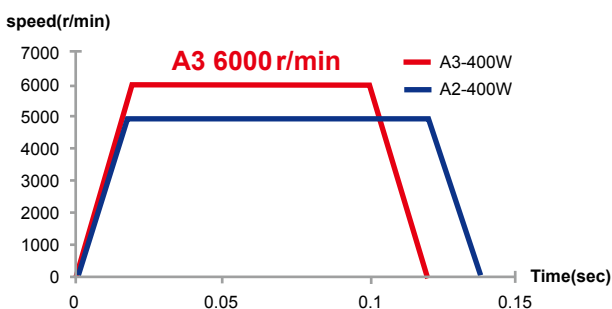
- ▶ The positioning precision is enhanced by the 16,777,216 pulses/turn encoder
- ▶ The speed variance in low speed is reduced.
- ▶ Absolute type encoder helps to keep motor's position when power is off



High speed motor with 6000 r/min and 350 % peak torque

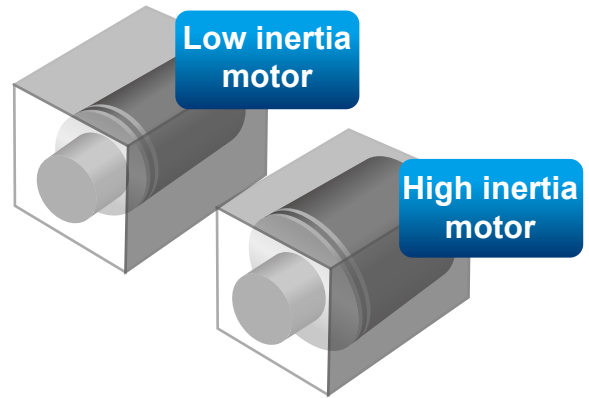
- ▶ A3 motor can accelerate and decelerate faster with its design

- ▶ This specification is available for motor frame size 40 mm, 60 mm and 80mm



Motor with high or low inertia rotor

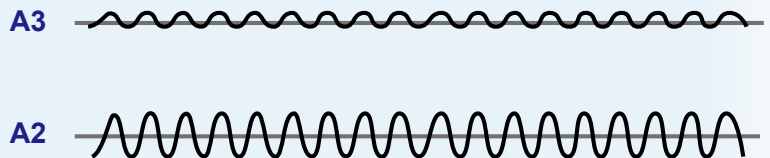
- ▶ For application requiring stable rotating speed and better disturbance resistant capability, a high inertia motor is more suitable, such as machine tools
- ▶ For application like reciprocating motion and fast positioning request, a low inertia motor can be used, such as electronic manufacturing machines



Low Cogging Torque Motor

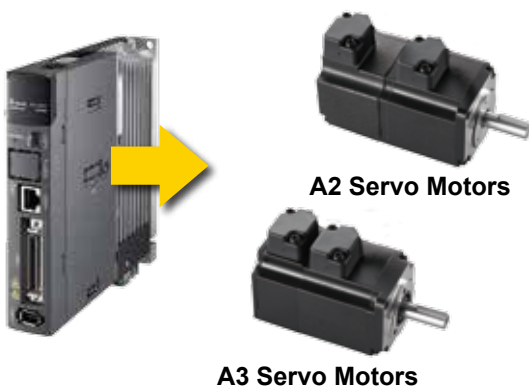
- ▶ Cogging torque of the ECM-A3 motor is only 1.5% of the rated torque, which brings smoother operating speed and increases the stability when machining at low speed

Cogging Torque (under 1.5%)



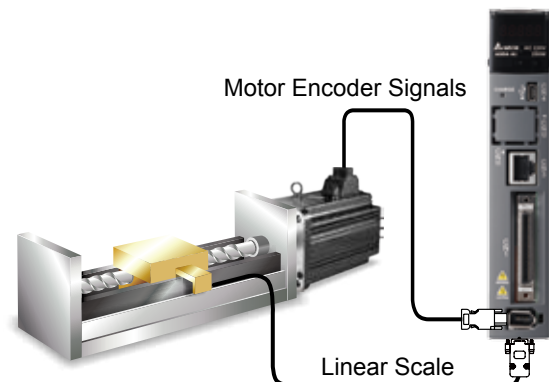
Supports a Variety of Servo Motors

- ▶ Backward compatibility design for motor to meet future replacement
- ▶ ASDA-A3 drive can support both A2 (ECMA) and A3 (ECM-A3) series motors



Full-Closed Loop Control

- ▶ To ensure the positioning accuracy at the end and eliminate the effect of transmission backlash, full-closed loop control function is an effective solution



System Tuning and Safety Functions

System Diagnosis Function

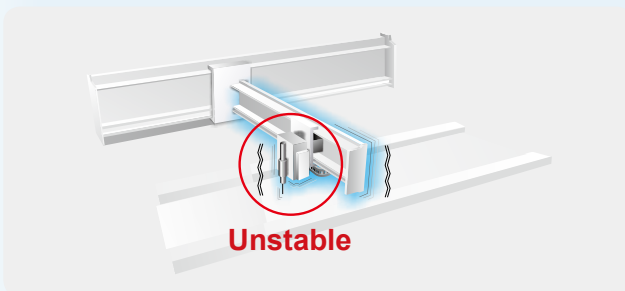
- ▶ The rigidity of a machine is known through a mathematical model
- ▶ The consistency of the machine's batch installation can be checked
- ▶ By comparing the data from different time span, the wear condition of a machine can be acquired



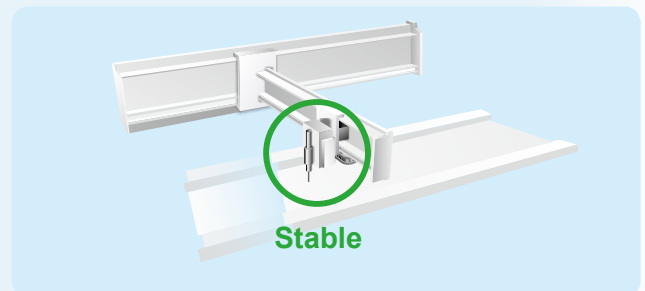
Low Frequency Vibration Suppression Function

- ▶ Vibration elimination algorithm is different from command filter and used as a creative algorithm on ASDA-A3
- ▶ The vibration can be eliminated without slowing down its response
- ▶ In addition to vibration elimination algorithm, the two command filters for low frequency vibration are included

Without Vibration Suppression

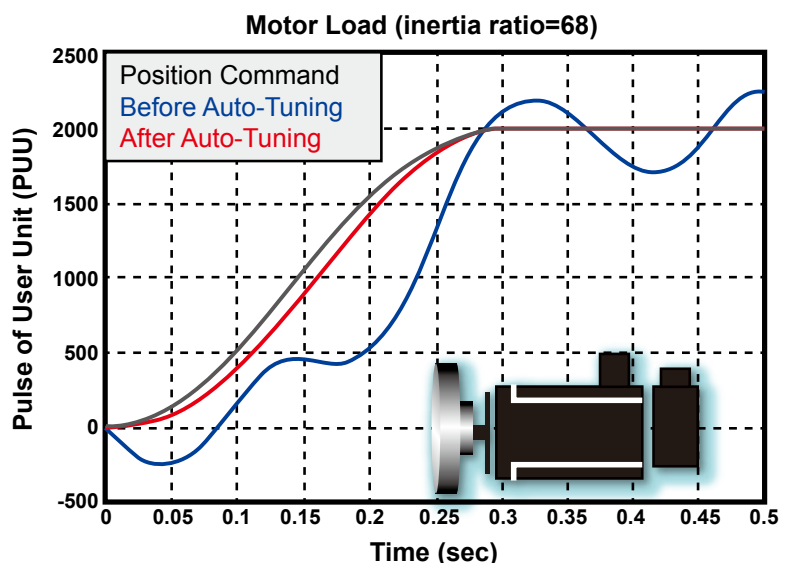


Delta Vibration Suppression



Auto-Tuning Function

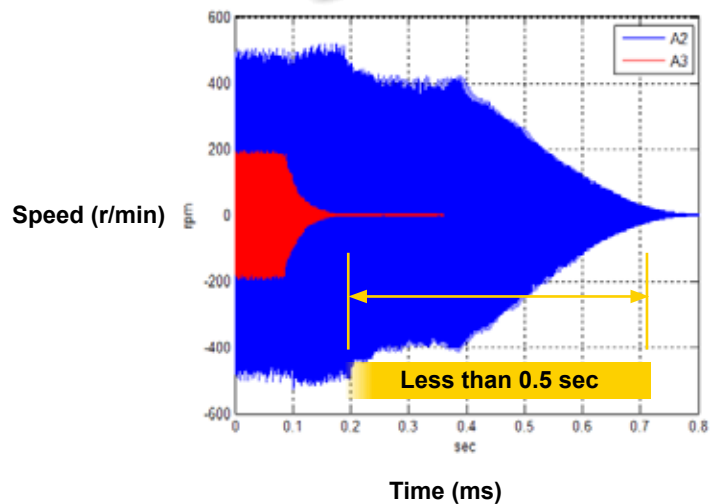
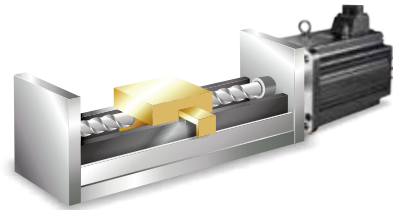
- ▶ Lower the barrier for users to use servo systems
- ▶ This function will optimize the machine performance with less tuning effort
- ▶ It can be done via panel keypad or software



Advanced Notch Filter

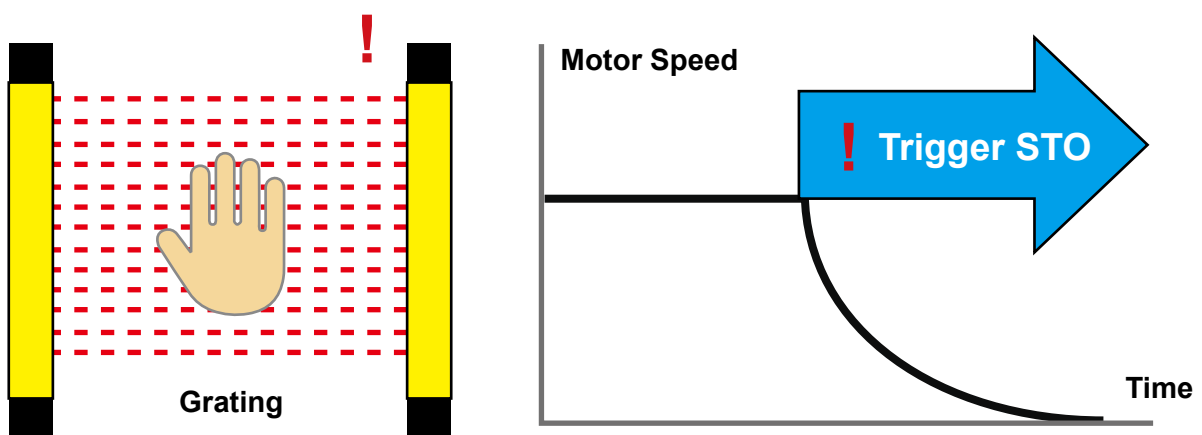
- ▶ There are 5 sets of notch filters with tunable bandwidth and up to 5000 Hz band for ASDA-A3
- ▶ Those filters can search resonance and set the attenuation level automatically
- ▶ With shorter search time for resonance, the machine is less likely to be damaged

Test Machine Layout



Safe Torque Off (STO) Function *note : will be certified

- ▶ Built-in STO (Safe Torque Off) function
- ▶ The motor power will be cut-off when STO is activated

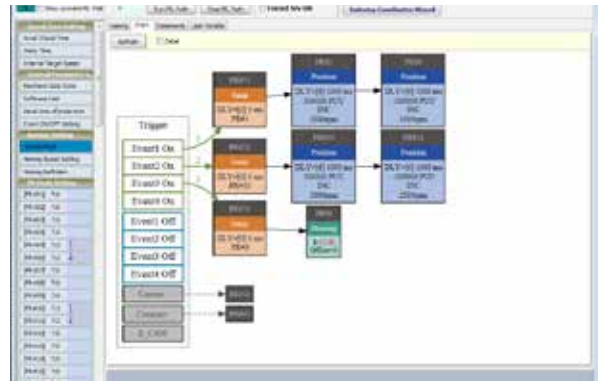


Motion Inside



Motion Inside

- ▶ 99 sophisticated motion commands and segments allowed
- ▶ Arithmetic operation and condition jump commands are added
- ▶ Graphical user interface offers simple setup and programming
- ▶ General motion functions like homing, position and speed commands are available
- ▶ Superimposition, blending and on-the-fly change motion commands are provided



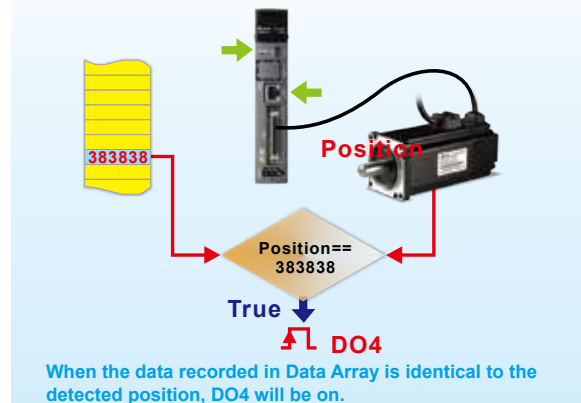
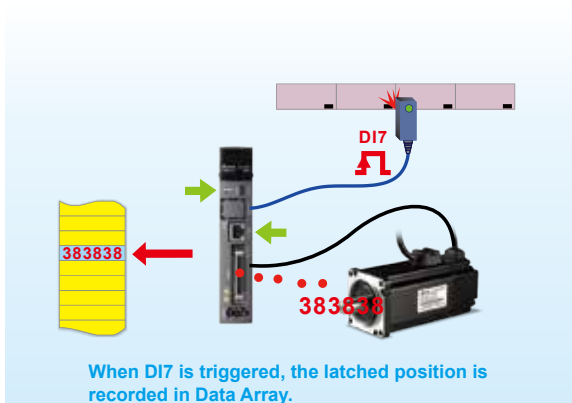
Built-in Camming Functions

- ▶ E-CAM functions for flying shear and rotary cut are well configured
- ▶ There are maximum 720 points in one cam profile or contour with interpolation smooth algorithm
- ▶ Useful E-CAM phase secure and adjustment functions are easy to apply
- ▶ Many successful applications from ASDA-A2 are available for reference



Capture and Compare Functions

- ▶ It is only 5 μ s response time to latch the position or pulse count after receiving the activated DI single.
- ▶ The high-speed DO will response when assigned position or count value is reached after 5 μ s response time

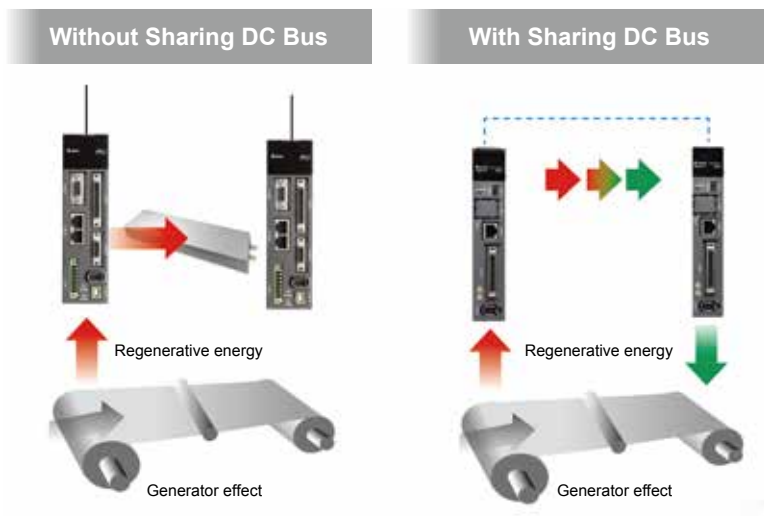


Energy-Saving and Compact Size Design



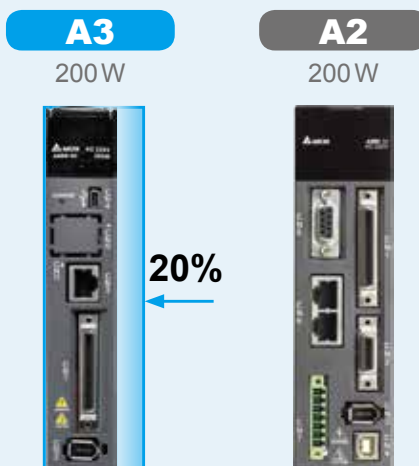
DC-bus Sharing Feature

- ▶ The regenerative energy will be collected to DC-bus for other axes to increase energy efficiency
- ▶ Smaller resistor installed is possible for the system, which can save cost and installation space



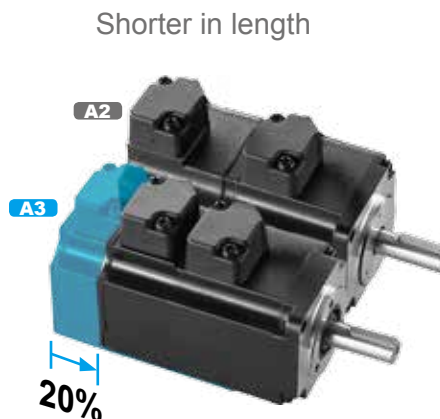
Thinner Size Servo Drive

- ▶ ASDA-A3 is 20% smaller than A2 on dimensions, which requires less installation space



Smaller Size Servo Motor

- ▶ ASDA-A3 series servo motor is 20% shorter than A2's

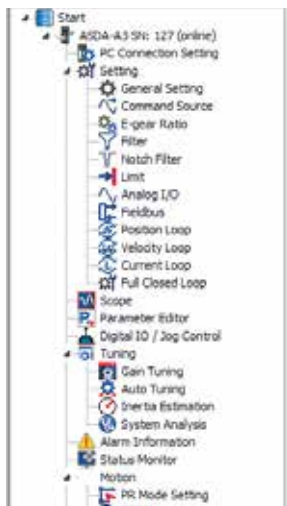


User-Friendly Software



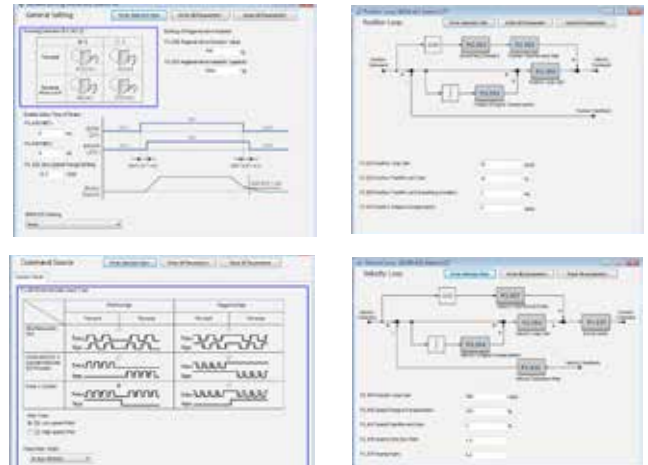
Tree-View Index Window

- ▶ Well organized list and collapsible menu help to access functions easily



Graphical Interface for Parameter Settings

- ▶ Intuitive user interface provides set up functions and parameters without manual findings



Auto-Tuning Wizard for Gains

- ▶ Provides step by step guiding wizard for users to tune a servo



Advanced Gain Tuning Interface

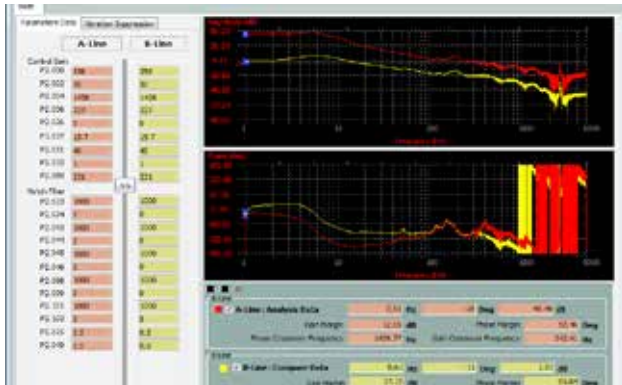
- ▶ The servo gains can be easily fine-tuned for better performance with its well-designed tuning modes



System Analysis in Bode Plot

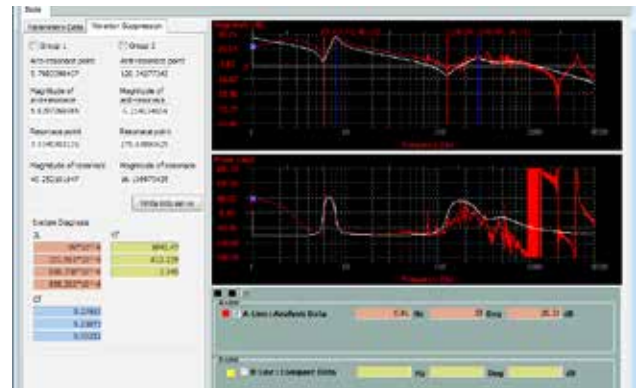
Speed Open-Loop Mode

Checks the bode plot to know the margin for stability for properly tuned system



System Module Mode

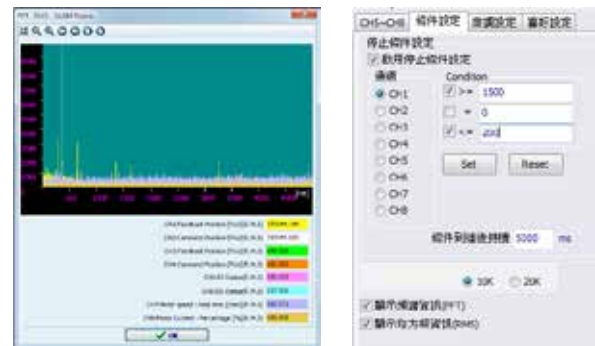
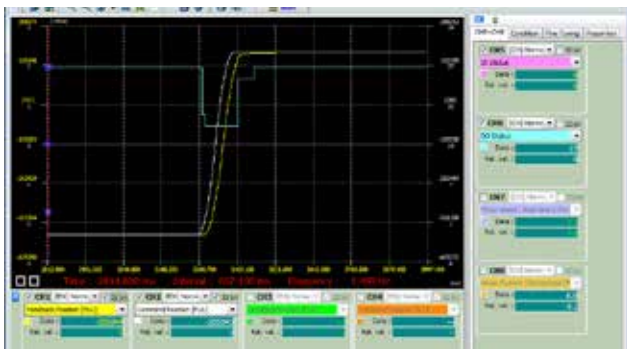
The machine rigidity can be judged from the bode plot in this mode



Oscilloscope Function

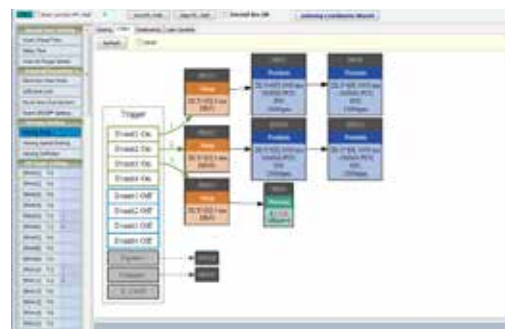
- ▶ The channel configurations for applying the PC scope include:
 - 8 channels with 16-bit data size and 10 kHz sampling rate
 - 4 channels with 32-bit data size and 10 kHz sampling rate
 - 4 channels with 16 bit data size and 20 kHz sampling rate

- ▶ Offers FFT (Fast Fourier Transform) function for checking its signal spectrum
- ▶ The RMS value can be calculated by selecting the period of a signal
- ▶ The conditions of start-to-record and stop-recording can be configured



Graphical Programming Interface of PR mode

- ▶ This tool easily allow users to write and trace programs including Jump instructions



Ordering Information

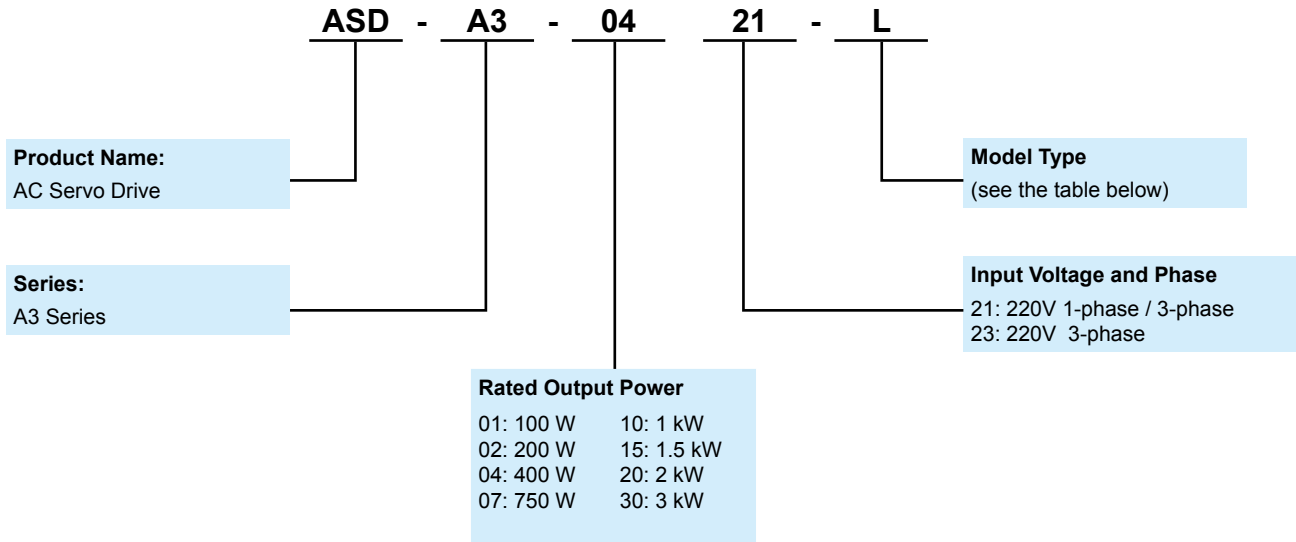
Product Line Up

| Servo Motors | | | | | | | Servo Drives | | |
|---------------------|-----------------------|------------------------|------------------------------|---|------------------|-------------|----------------------------------|--------------------------------|-------|
| Motor Series | Phase | Rated Output Power (W) | Model Name | Rated current (Arms) | Max. current (A) | Model Name | Continuous Output Current (Arms) | Max. Instantaneous Current (A) | |
| Low Inertia | ECM-A3L 3000 r/min | 1-phase / 3-phase | 50 | ECM-A3L-C ^[1] 040F ^[2] S1 | 0.67 | 2.62 | ASD-A3-0121 | 0.9 | 3.54 |
| | | | 100 | ECM-A3L-C ^[1] 0401 ^[2] S1 | 0.89 | 3.5 | | | |
| | | | 200 | ECM-A3L-C ^[1] 0602 ^[2] S1 | 1.45 | 5.0 | | | |
| | | | 400 | ECM-A3L-C ^[1] 0604 ^[2] S1 | 2.65 | 8.5 | | | |
| | | | 400 | ECM-A3L-C ^[1] 0804 ^[2] 71 | 2.6 | 8.6 | | | |
| | | | 750 | ECM-A3L-C ^[1] 0807 ^[2] S1 | 5.1 | 15.9 | | | |
| Medium-High Inertia | ECMC-C 3000 r/min | 1-phase / 3-phase | 1000 | ECMC-CW1010 ^[2] S | 7.3 | 21.9 | ASD-A3-1021 | 7.3 | 24.75 |
| | ECMC-E 2000 r/min | | 1000 | ECMC-EW1310 ^[2] S | 5.6 | 16.8 | | | |
| | | 1500 | ECMC-EW1315 ^[2] S | 8.3 | 24.9 | ASD-A3-1521 | 8.3 | 35.36 | |
| | | 2000 | ECMC-EW1320 ^[2] S | 11.01 | 33.0 | ASD-A3-2023 | 13.4 | 53.03 | |
| | | 2000 | ECMC-EW1820 ^[2] S | 11.22 | 33.7 | | | | |
| | | 3000 | ECMC-EW1830 ^[2] S | 16.1 | 48.3 | | | | |
| | ECMC-F 1500 r/min | 3-phase | 3000 | ECMC-FW1830 ^[2] S | 19.4 | 58.2 | ASD-A3-3023 | 19.4 | 70.71 |
| High Inertia | ECM-A3H 3000 r/min | 1-phase / 3-phase | 50 | ECM-A3H-C ^[1] 040F ^[2] S1 | 0.67 | 2.68 | ASD-A3-0121 | 0.9 | 3.54 |
| | | | 100 | ECM-A3H-C ^[1] 0401 ^[2] S1 | 0.89 | 3.52 | | | |
| | | | 200 | ECM-A3H-C ^[1] 0602 ^[2] S1 | 1.45 | 5.4 | | | |
| | | | 400 | ECM-A3H-C ^[1] 0604 ^[2] S1 | 2.65 | 9.9 | | | |
| | | | 400 | ECM-A3H-C ^[1] 0804 ^[2] 71 | 2.6 | 9.4 | | | |
| | | | 750 | ECM-A3H-C ^[1] 0807 ^[2] S1 | 4.5 | 16.6 | | | |
| | ECMC-F 1500 r/min | 1-phase / 3-phase | 850 | ECMC-FW1308 ^[2] S | 7.1 | 19.4 | ASD-A3-1021 | 7.3 | 24.75 |
| | | | 1300 | ECMC-FW1313 ^[2] S | 12.6 | 38.6 | ASD-A3-1523 | 13.4 | 53.03 |
| | | | 1800 | ECMC-FW1318 ^[2] S | 13 | 36 | ASD-A3-2023 | 13.4 | 53.03 |

Note: In servo motor model names, ^[1] signifies encoder type, ^[2] signifies brake or keyway/oil seal.

Model Explanation

ASDA-A3 Series Servo Drives



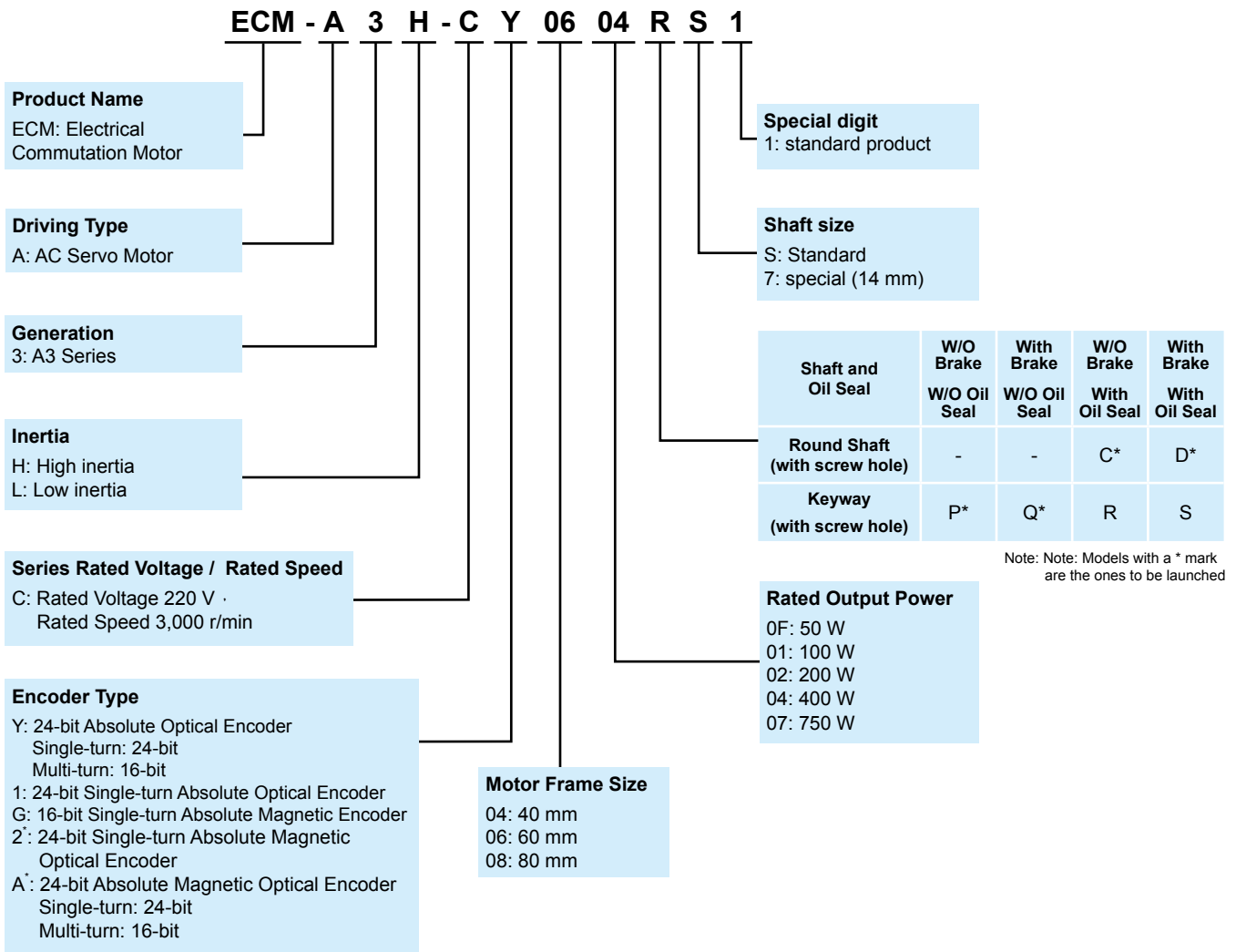
| Type | PT Mode Pulse Train | PR Mode | RS-485 | CANopen | DMCNET | EtherCAT | Full-closed Loop Control | Analog Voltage Control | E-CAM | STO |
|------|------------------------|---------|--------|---------|--------|----------|-----------------------------|---------------------------|-------|-----|
| L | ○ | ○ | ○ | X | X | X | ○ | ○ | X | X |
| M | ○ | ○ | ○ | ○ | X | X | ○ | ○ | ○ | ○ |
| F | X | ○ | X | X | ○ | X | ○ | X | ○ | X |
| E* | X | ○ | X | X | X | ○ | ○ | X | ○ | ○ |

Note: Models with a * mark are the ones to be launched.



Model Explanation

ECM-A3 Series Servo Motors

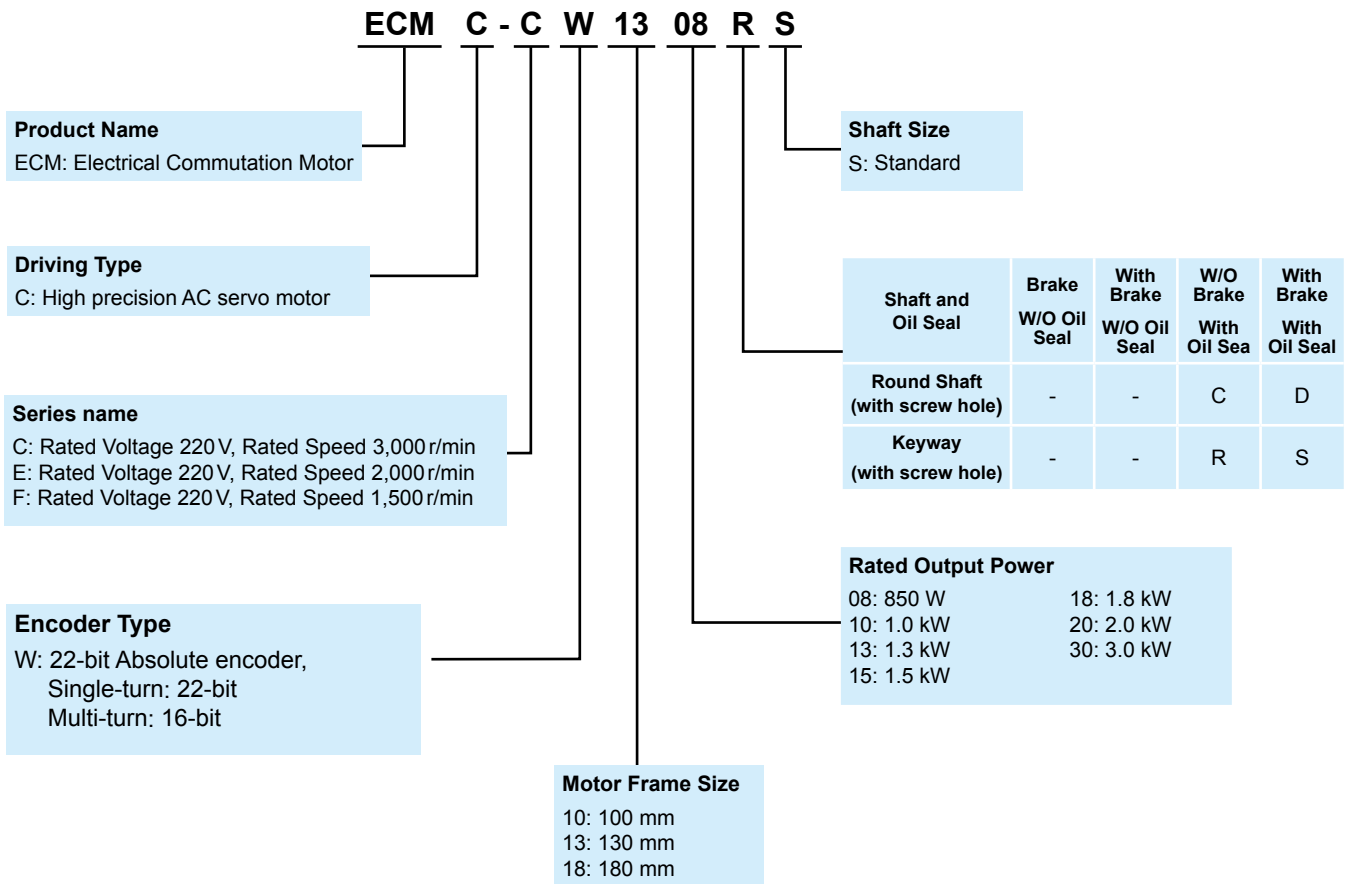


*To be launched



Model Explanation

ECMC Series Servo Motors



Servo Motor Features

The ECM-A3 Series AC Servo Motor, a high-precision permanent magnet AC servo motor, can be used with the ASDA-A3 AC Servo Drives of 200 ~ 230 V which power is selectable from of 50 W ~ 750 W. Motor frame sizes offer 40 mm, 60 mm and 80 mm. Two motor models are available, the ECM-A3H high inertia and the ECM-A3L low inertia which rated speed is 3000 r/min and the Max. speed is 6000 r/min. The Max. torque of the ECM-A3H is 0.557 N-m ~ 8.36 N-m and that of ECM-A3L is 0.557 N-m ~ 7.17 N-m.


The ECMC Series AC Servo Motor, a high precision permanent magnet AC servo motor, can also be applied with the ASDA-A3 220 V Series AC Servo Drive which power range is 850 W ~ 3 kW. The available frame sizes are 100 mm, 130 mm, and 180 mm. Selectable rated torque are 1000 r/min, 2000 r/min, and 3000 r/m while the Max. speed is 3000 r/min and 5000 r/min. And the Max. torque is from 9.54 N-m to 57.3 N-m.

The ECM-A3 and the ECMC Series AC Servo Motors provide optional devices, brakes and oil seals, as well as two shaft types, round shaft and keyway.



Servo Motor Specifications

Servo Motor Specifications Low Inertia Series- ECM-A3L

| ECM-A3L Series | C104 | | C106 | | C108 | |
|---|--|--------|-------|-------|-------|-------|
| | 0F | 01 | 02 | 04 | 04 | 07 |
| Rated output power (kW) | 0.05 | 0.1 | 0.2 | 0.4 | 0.4 | 0.75 |
| Rated torque (N-m) ^{*1} | 0.159 | 0.32 | 0.64 | 1.27 | 1.27 | 2.39 |
| Maximum torque (N-m) | 0.557 | 1.12 | 1.92 | 3.82 | 3.82 | 7.17 |
| Rated speed (r/min) | 3000 | | | | | |
| Maximum speed (r/min) | 6000 | | | | | |
| Rated current (A) | 0.67 | 0.89 | 1.45 | 2.65 | 2.6 | 5.1 |
| Maximum current (A) | 2.62 | 3.5 | 5.0 | 8.5 | 8.6 | 15.9 |
| Power rating (kW/s) | 10.9 | 25.3 | 45.51 | 107.5 | 45.4 | 111.4 |
| Rotor moment of inertia (x10 ⁻⁴ kg-m ²)(Without a brake) | 0.0231 | 0.0405 | 0.09 | 0.15 | 0.355 | 0.513 |
| Mechanical time constant (ms) | 1.31 | 0.817 | 0.64 | 0.41 | 0.68 | 0.405 |
| Torque constant (N-m/A) | 0.237 | 0.36 | 0.44 | 0.48 | 0.49 | 0.469 |
| Voltage constant-KE (mV/(r/min)) | 9.28 | 13.6 | 16.4 | 18.0 | 17.9 | 17 |
| Armature resistance (Ohm) | 11.9 | 9.47 | 4.9 | 2.27 | 1.6 | 0.6 |
| Armature inductance (mH) | 18.6 | 16.2 | 18.52 | 10.27 | 10.6 | 4.6 |
| Electrical time constant (ms) | 1.56 | 1.71 | 3.78 | 4.52 | 6.63 | 7.67 |
| Insulation class | Class A (UL), Class B (CE) | | | | | |
| Insulation resistance | 100 MΩ · DC 500V above | | | | | |
| Insulation strength | 1.8k VAC · 1 sec | | | | | |
| Weight (kg)(without brake) | 0.38 | 0.5 | 1.1 | 1.4 | 2.05 | 2.8 |
| Weight (kg)(with brake) | 0.68 | 0.8 | 1.6 | 1.9 | 2.85 | 3.6 |
| Max. radial shaft load (N) | 78 | 78 | 245 | 245 | 392 | 392 |
| Max. thrust shaft load (N) | 54 | 54 | 74 | 74 | 147 | 147 |
| Power rating (kW/s)(with brake) | 10.3 | 24.5 | 37.24 | 89.6 | 41 | 95.4 |
| Rotor moment of inertia (x10 ⁻⁴ kg-m ²)(with brake) | 0.0246 | 0.0418 | 0.12 | 0.18 | 0.393 | 0.599 |
| Mechanical time constant (ms)(with brake) | 1.39 | 0.894 | 0.88 | 0.47 | 0.75 | 0.47 |
| Brake holding torque [Nt-m (min)] ² | 0.32 | 0.32 | 1.3 | 1.3 | 2.5 | 2.5 |
| Brake power consumption (at 20°C)[W] | 7.3 | 7.3 | 7.2 | 7.2 | 8.4 | 8.4 |
| Brake release time [ms (Max)] | 5 | 5 | 20 | 20 | 20 | 20 |
| Brake pull-in time [ms (Max)] | 25 | 25 | 50 | 50 | 70 | 70 |
| Vibration grade (μm) | 16 | | | | | |
| 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 used to be fitted to the rotating shaft (an oil seal model is used)) | | | | | |
| Approvals |  | | | | | |

Note:

1. The rated torque is the permissible continuous torque at the operation temperature of 0~40°C when the following heat sink is applied:


ECM-A3: __04/06/ 08 : 250 mm x 250mm x 6mm

Material type: Aluminum- F60, F80

2. The built-in brake of the servo motor is for calmping the shaft. Never use it for decelerating or stopping the motor

Servo Motor Specifications

High Inertia Series- ECM-A3H

| ECM-A3H Series | C104 | | C106 | | C108 | |
|---|--|--------|-------|-------|------|------|
| | 0F | 01 | 02 | 04 | 04 | 07 |
| Rated output power (kW) | 0.05 | 0.1 | 0.2 | 0.4 | 0.4 | 0.75 |
| Rated torque (N-m) ¹ | 0.159 | 0.32 | 0.64 | 1.27 | 1.27 | 2.39 |
| Maximum torque (N-m) | 0.557 | 1.12 | 2.24 | 4.45 | 4.44 | 8.36 |
| Rated speed (r/min) | 3000 | | | | | |
| Maximum speed (r/min) | 6000 | | | | | |
| Rated current (A) | 0.67 | 0.9 | 1.45 | 2.65 | 2.6 | 4.5 |
| Maximum current (A) | 2.68 | 3.52 | 5.4 | 9.9 | 9.4 | 16.6 |
| Power rating (kW/s) | 5.89 | 13.8 | 16.4 | 35.8 | 17.5 | 37.8 |
| Rotor moment of inertia (x10 ⁻⁴ kg-m ²)(Without a brake) | 0.043 | 0.0742 | 0.25 | 0.45 | 0.92 | 1.51 |
| Mechanical time constant (ms) | 2.49 | 1.38 | 1.37 | 0.96 | 1.31 | 0.91 |
| Torque constant (N-m/A) | 0.237 | 0.356 | 0.44 | 0.48 | 0.49 | 0.53 |
| Voltage constant-KE (mV/(r/min)) | 9.54 | 13.2 | 16.4 | 17.2 | 17.9 | 18.7 |
| Armature resistance (Ohm) | 12.5 | 8.34 | 3.8 | 1.68 | 1.19 | 0.57 |
| Armature inductance (mH) | 13.3 | 11 | 8.15 | 4.03 | 4.2 | 2.2 |
| Electrical time constant (ms) | 1.07 | 1.32 | 2.14 | 2.40 | 3.53 | 3.86 |
| Insulation class | Class A (UL), Class B (CE) | | | | | |
| Insulation resistance | 100 MΩ · DC 500V above | | | | | |
| Insulation strength | 1.8k VAC · 1 sec | | | | | |
| Weight (kg)(without brake) | 0.38 | 0.5 | 1.1 | 1.4 | 2.05 | 2.8 |
| Weight (kg)(with brake) | 0.68 | 0.8 | 1.6 | 1.9 | 2.85 | 3.6 |
| Max. radial shaft load (N) | 78 | 78 | 245 | 245 | 392 | 392 |
| Max. thrust shaft load (N) | 54 | 54 | 74 | 74 | 147 | 147 |
| Power rating (kW/s)(with brake) | 5.68 | 13.6 | 15.17 | 34.32 | 15.1 | 34.4 |
| Rotor moment of inertia (x10 ⁻⁴ kg-m ²)(with brake) | 0.0446 | 0.0755 | 0.28 | 0.48 | 1.07 | 1.66 |
| Mechanical time constant (ms)(with brake) | 2.58 | 1.4 | 1.52 | 1.01 | 1.53 | 1 |
| Brake holding torque [Nt-m (min)] ² | 0.32 | 0.32 | 1.3 | 1.3 | 2.5 | 2.5 |
| Brake power consumption (at 20°C)[W] | 7.3 | 7.3 | 7.2 | 7.2 | 8.4 | 8.4 |
| Brake release time [ms (Max)] | 5 | 5 | 20 | 20 | 20 | 20 |
| Brake pull-in time [ms (Max)] | 25 | 25 | 50 | 50 | 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 used to be fitted to the rotating shaft (an oil seal model is used)) | | | | | |
| Approvals |  | | | | | |

Note:

1. The rated torque is the permissible continuous torque at the operation temperature of 0~40 °C when the following heat sink is applied:


ECM-A3:___04/06/ 08 : 250 mm x 250mm x 6mm

Material type: Aluminum- F60, F80

2. The built-in brake of the servo motor is for clamping the shaft. Never use it for decelerating or stopping the motor

Servo Motor Specifications

Medium Inertia ECMC Series- Frame Sizes 100~180 mm


| ECMC Series | C110 | E113 | | | E118 | | F118 | |
|---|--|------|------|-------|-------|-------|-------|--|
| | 10 | 10 | 15 | 20 | 20 | 30 | 30 | |
| Rated output power (kW) | 1.0 | 1.0 | 1.5 | 2.0 | 2.0 | 3.0 | 3.0 | |
| Rated torque (N-m) ¹ | 3.18 | 4.77 | 7.16 | 9.55 | 9.55 | 14.32 | 19.10 | |
| Maximum torque (N-m) | 9.54 | 14.3 | 21.5 | 28.7 | 28.7 | 43 | 57.3 | |
| Rated speed (r/min) | 3000 | 2000 | | | 2000 | | 1500 | |
| Maximum speed (r/min) | 5000 | 3000 | | | 3000 | | 3000 | |
| Rated current (A) | 7.3 | 5.6 | 8.3 | 11.01 | 11.2 | 16.1 | 19.4 | |
| Maximum current (A) | 21.9 | 16.8 | 24.9 | 33 | 33.7 | 48.3 | 58.2 | |
| Power rating (kW/s) | 38.1 | 27.1 | 45.9 | 62.5 | 26.3 | 37.3 | 66.4 | |
| Rotor moment of inertia (x10 ⁻⁴ kg-m ²)(Without a brake) | 2.65 | 8.41 | 11.2 | 14.6 | 34.7 | 55 | 55 | |
| Mechanical time constant (ms) | 0.74 | 1.51 | 1.10 | 0.96 | 1.62 | 1.06 | 1.28 | |
| Torque constant (N-m/A) | 0.44 | 0.85 | 0.87 | 0.87 | 0.85 | 0.89 | 0.98 | |
| Voltage constant-KE (mV/(r/min)) | 16.8 | 31.9 | 31.8 | 31.8 | 31.4 | 32.0 | 35 | |
| Armature resistance (Ohm) | 0.20 | 0.47 | 0.26 | 0.174 | 0.119 | 0.052 | 0.077 | |
| Armature inductance (mH) | 1.81 | 5.99 | 4.01 | 2.76 | 2.84 | 1.38 | 1.27 | |
| Electrical time constant (ms) | 9.3 | 12.9 | 15.3 | 15.9 | 23.9 | 26.4 | 16.5 | |
| Insulation class | Class A (UL), Class B (CE) | | | | | | | |
| Insulation resistance | 100 MΩ · DC 500 V above | | | | | | | |
| Insulation strength | 1.8k VAC · 1sec | | | | | | | |
| Weight (kg)(without brake) | 4.3 | 7.0 | 7.5 | 7.8 | 13.5 | 18.5 | 18.5 | |
| Weight (kg)(with brake) | 4.7 | 8.4 | 8.9 | 9.2 | 17.5 | 22.5 | 22.5 | |
| Max. radial shaft load (N) | 490 | | | | 1176 | 1470 | | |
| Max. thrust shaft load (N) | 98 | | | | 490 | | | |
| Power rating (kW/s)(with brake) | 30.4 | 24.9 | 43.1 | 57.4 | 24.1 | 35.9 | 63.9 | |
| Rotor moment of inertia (x10 ⁻⁴ kg-m ²)(with brake) | 3.33 | 9.14 | 11.9 | 15.9 | 37.8 | 57.1 | 57.1 | |
| Mechanical time constant (ms)(with brake) | 0.93 | 1.64 | 1.19 | 1.05 | 1.77 | 1.10 | 1.33 | |
| Brake holding torque [Nt-m (min)] ² | 8 | | 10 | | | 25 | | |
| Brake power consumption (at 20°C)[W] | 18.7 | | 19 | | | 20.4 | | |
| Brake release time [ms (Max)] | 10 | | | | | | | |
| Brake pull-in time [ms (Max)] | 70 | | | | | | | |
| Vibration grade (μm) | V15 | | | | | | | |
| Operating temperature (°C) | 0°C ~ 40°C (32°F ~ 104°F) | | | | | | | |
| Storage temperature (°C) | -10°C ~ 80°C (-14°F ~ 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 |  | | | | | | | |

Note:
 1. □ in the servo model name signifies encoder type.
 2. The rated torque is the permissible continuous torque at the operation temperature of 0~40 °C when the following heat sink is applied:
 ECMC-__10 : 300 mm x 300 mm x 12 mm
 ECMC-__13 : 400 mm x 400 mm x 20 mm
 ECMC-__18 : 550 mm x 550 mm x 30 mm
 Material type: Aluminum- F60, F80
 3. The built-in brake of the servo motor is for calmping the shaft. Never use it for decelerating or stopping the motor



Servo Motor Specifications

High Inertia ECMC Series-Frame Sizes 130 mm

| ECMC Series | F13 | | |
|---|--|-------|-------|
| | 08 | 13 | 18 |
| Rated output power (kW) | 0.85 | 1.3 | 1.8 |
| Rated torque (N-m) ¹ | 5.41 | 8.34 | 11.48 |
| Maximum torque (N-m) | 13.8 | 23.3 | 28.7 |
| Rated speed (r/min) | 1500 | | |
| Maximum speed (r/min) | 3000 | | |
| Rated current (A) | 7.1 | 12.6 | 13 |
| Maximum current (A) | 19.4 | 38.6 | 36 |
| Power rating (kW/s) | 21.52 | 34.78 | 53 |
| Rotor moment of inertia (x10 ⁻⁴ kg-m ²)(Without a brake) | 13.6 | 20 | 24.9 |
| Mechanical time constant (ms) | 2.43 | 1.62 | 1.7 |
| Torque constant-KT (N-m/A) | 0.76 | 0.66 | 0.88 |
| Voltage constant-KE (mV/(r/min)) | 29.2 | 24.2 | 32.2 |
| Armature resistance (Ohm) | 0.38 | 0.124 | 0.185 |
| Armature inductance (mH) | 4.77 | 1.7 | 2.6 |
| Electrical time constant (ms) | 12.6 | 13.7 | 14.1 |
| Insulation class | Class A (UL), Class B (CE) | | |
| Insulation resistance | 100 MΩ · DC 500V above | | |
| Insulation strength | 1.8k VAC · 1 sec | | |
| Weight (kg)(without brake) | 8.6 | 9.4 | 10.5 |
| Weight (kg)(with brake) | 10 | 10.8 | 11.9 |
| Max. radial shaft load (N) | 490 | | |
| Max. thrust shaft load (N) | 98 | | |
| Power rating (kW/s)(with brake) | 19.8 | 32.7 | 50.3 |
| Rotor moment of inertia (x10 ⁻⁴ kg-m ²)(with brake) | 14.8 | 21.3 | 26.2 |
| Mechanical time constant (ms)(with brake) | 2.65 | 1.73 | 1.79 |
| Brake holding torque [Nt-m (min)] ² | 10 | | |
| Brake power consumption (at 20°C)[W] | 19 | | |
| Brake release time [ms (Max)] | 10 | | |
| Brake pull-in time [ms (Max)] | 70 | | |
| Vibration grade (μm) | V15 | | |
| Operating temperature (°C) | 0°C ~ 40°C (32°F ~ 104°F) | | |
| Storage temperature (°C) | -10°C ~ 80°C (-14°F ~ 176°F) | | |
| Operating humidity | 20 ~ 90%RH (non-condensing) | | |
| Storage humidity | 20 ~ 90%RH (non-condensing) | | |
| Vibration capacity | 2.5 G | | |
| 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 |  | | |

Note:

1. □ In the servo model name signifies encoder type.

2. The rated torque is the permissible continuous torque at the operation temperature of 0~40 °C when the following heat sink is applied:

ECMC-__10 : 300 mm x 300 mm x 12 mm

ECMC-__13 : 400 mm x 400 mm x 20 mm

ECMC-__18 : 550 mm x 550 mm x 30 mm

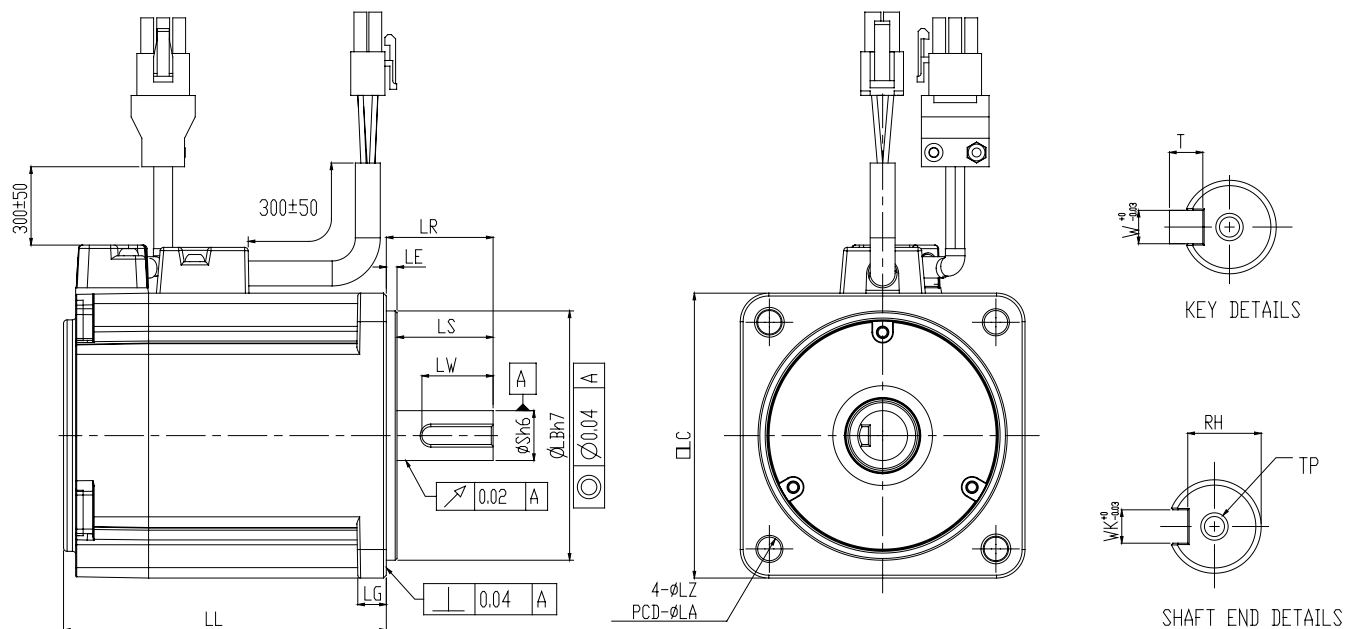
Material type: Aluminum- F100, F130, F180

3. The built-in brake of the servo motor is for calmping the shaft. Never use it for decelerating or stopping the motor

Servo Motor Dimensions

ECM-A3 Series

Frame Size 80 mm and Below



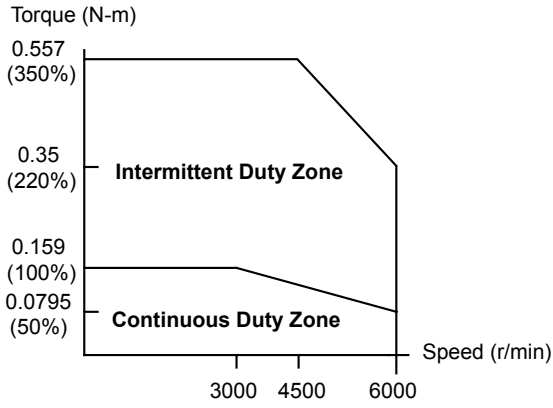
Units: mm

| Model | C □ 040F □ S □ | C □ 0401 □ S □ | C □ 0602 □ S □ | C □ 0604 □ S □ | C □ 0804 □ 7 □ | C □ 0807 □ S □ |
|--------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| LC | 40 | 40 | 60 | 60 | 80 | 80 |
| LZ | 4.5 | 4.5 | 5.5 | 5.5 | 6.6 | 6.6 |
| LA | 46 | 46 | 70 | 70 | 90 | 90 |
| S | 8 ($^{+0}_{-0.009}$) | 8 ($^{+0}_{-0.009}$) | 14 ($^{+0}_{-0.011}$) | 14 ($^{+0}_{-0.011}$) | 14 ($^{+0}_{-0.011}$) | 19 ($^{+0}_{-0.013}$) |
| LB | 30 ($^{+0}_{-0.021}$) | 30 ($^{+0}_{-0.021}$) | 50 ($^{+0}_{-0.025}$) | 50 ($^{+0}_{-0.025}$) | 70 ($^{+0}_{-0.03}$) | 70 ($^{+0}_{-0.03}$) |
| LL(with out brake) | 70.6 | 85.3 | 84 | 106 | 93.7 | 115.8 |
| LL(with brake) | 105.4 | 120.1 | 117.6 | 139.7 | 131.2 | 153.2 |
| LS | 21.5 | 22.5 | 27 | 27 | 27 | 37 |
| LR | 25 | 25 | 30 | 30 | 30 | 40 |
| LE | 2.5 | 2.5 | 3 | 3 | 3 | 3 |
| LG | 5 | 5 | 7.5 | 7.5 | 8 | 8 |
| LW | 16 | 16 | 20 | 20 | 20 | 25 |
| RH | 6.2 | 6.2 | 11 | 11 | 11 | 15.5 |
| WK | 3 | 3 | 5 | 5 | 5 | 6 |
| W | 3 | 3 | 5 | 5 | 5 | 6 |
| T | 3 | 3 | 5 | 5 | 5 | 6 |
| TP | M3 Depth 6 | M3 Depth 6 | M4 Depth 8 | M4 Depth 8 | M4 Depth 8 | M6 Depth 10 |

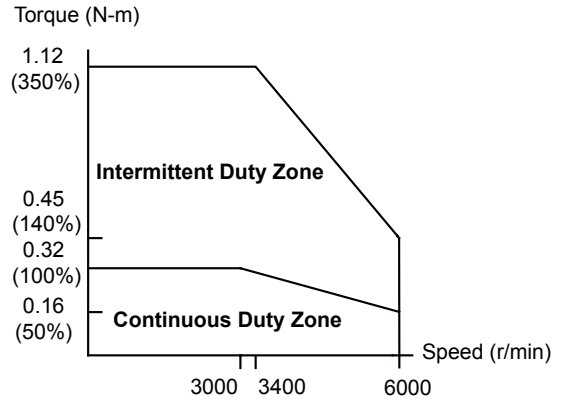
Note: Note: In servo motor model names, □ signifies encoder type, □ signifies shaft diameter and oil seal, and □ signifies special code

Speed-Torque Curves (T-N Curves)

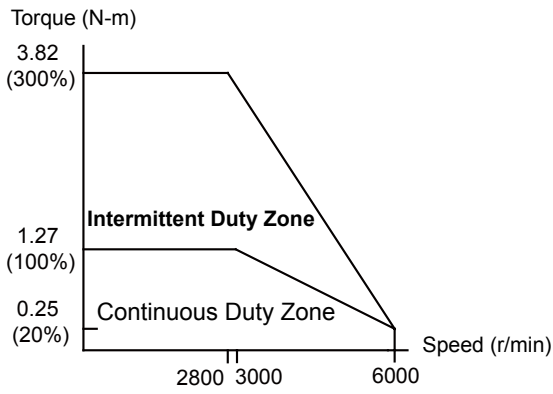
ECM-A3 Torque Features



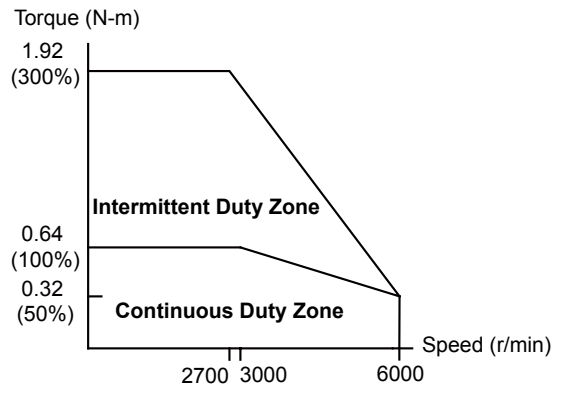
ECM-A3L-CΔ04F□S1



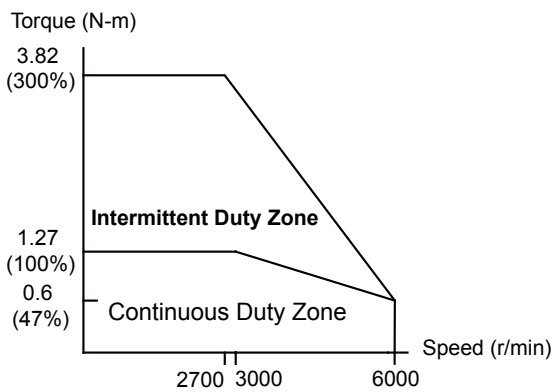
ECM-A3L-CΔ401□S1



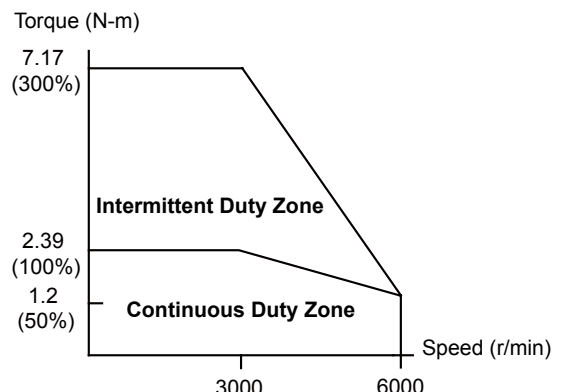
ECM-A3L-CΔ0604□S1



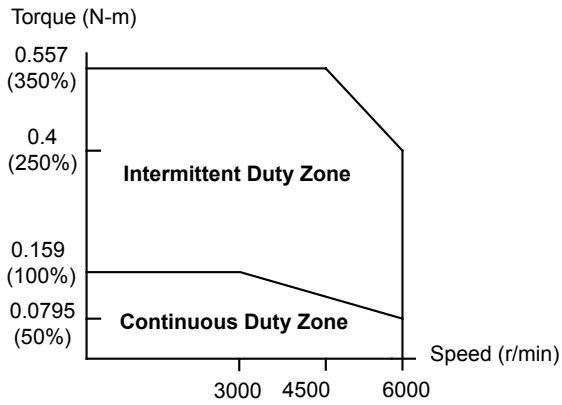
ECM-A3L-CΔ0602□S1



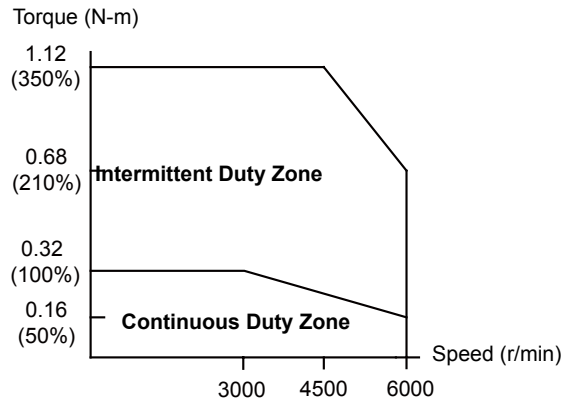
ECM-A3L-CΔ0804□S1



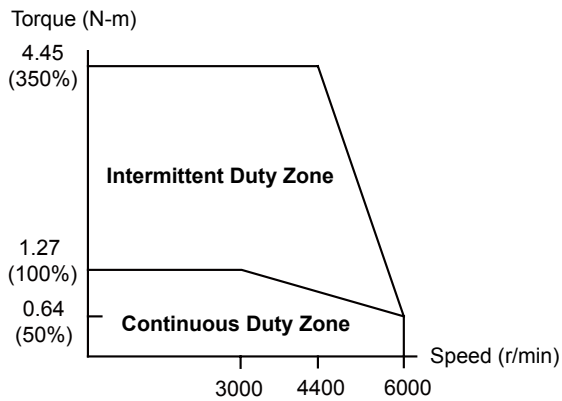
ECM-A3L-CΔ0807□S1



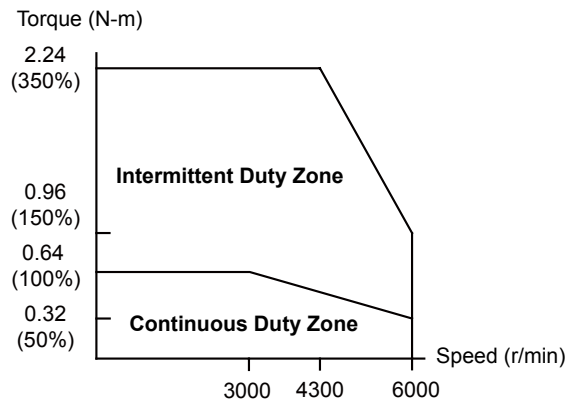
ECM-A3H-CΔ040F□S1



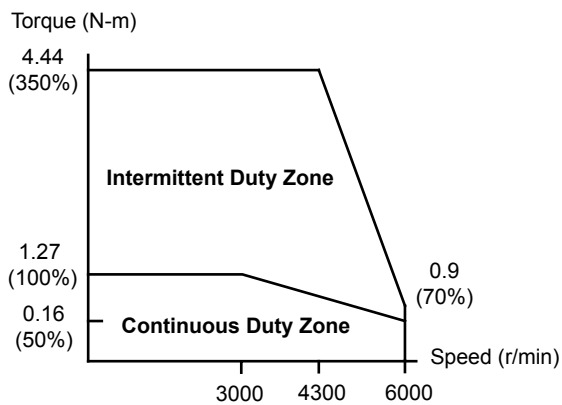
ECM-A3H-CΔ0401□S1



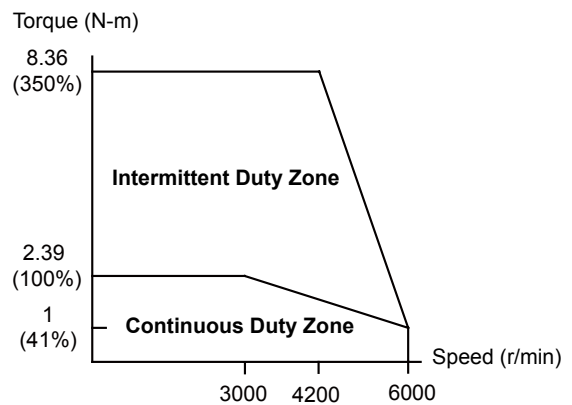
ECM-A3H-CΔ0604□S1



ECM-A3H-CΔ0602□S1



ECM-A3H-CΔ0804□S1

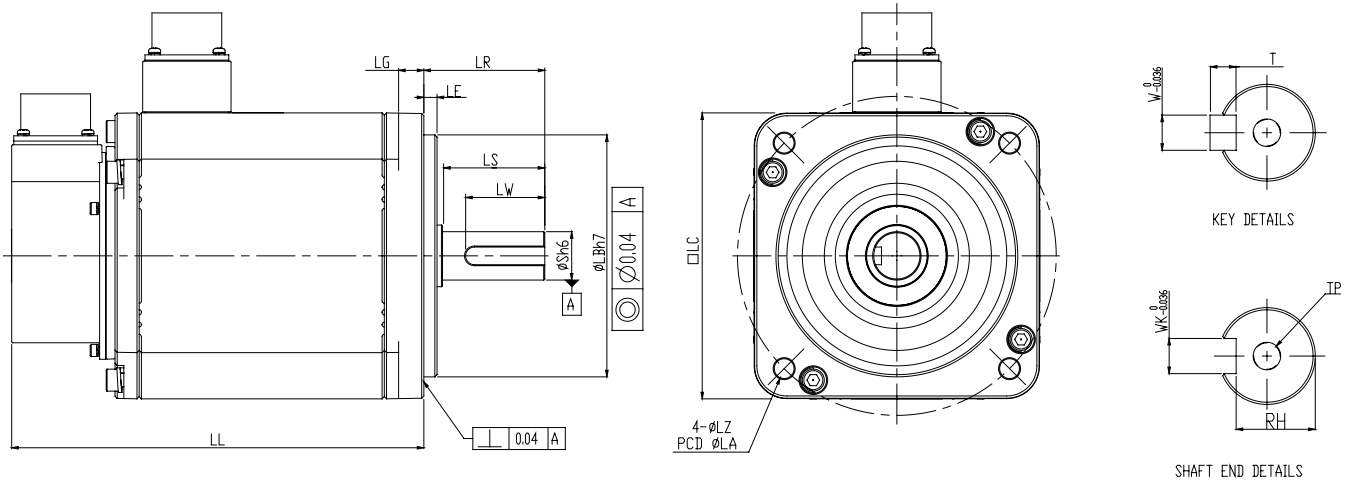


ECM-A3H-CΔ0807□S1

Servo Motor Dimensions

ECMC Series

Frame Sizes 100 / 130 mm



Units: mm

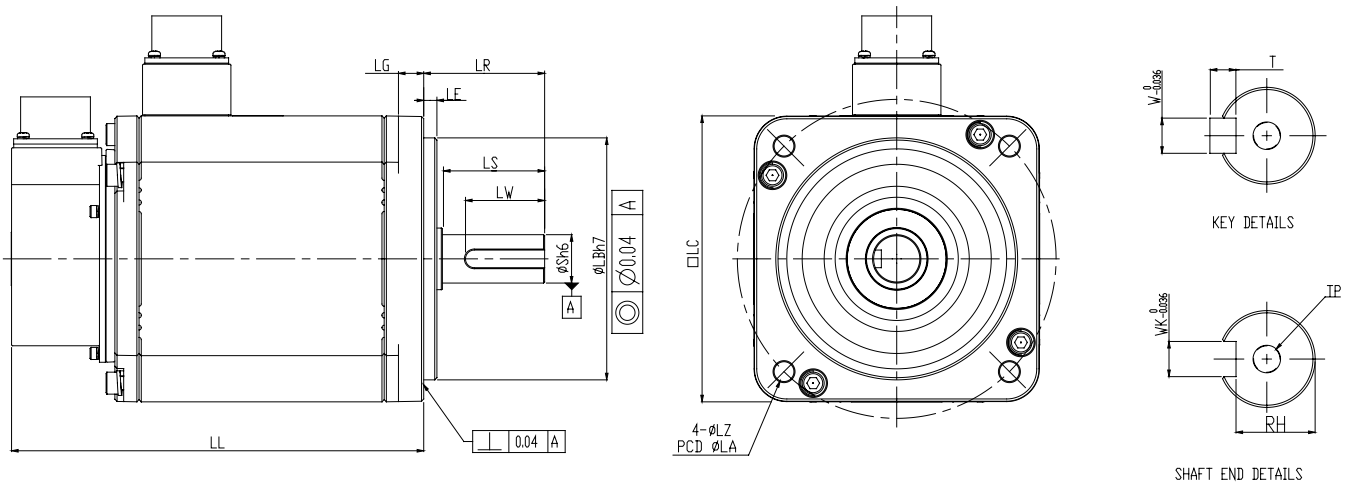
| Model | C □ 1010 □ S | E □ 1310 □ S | E □ 1315 □ S | E □ 1320 □ S | F □ 1308 □ S | F □ 1313 □ S | F □ 1318 □ S |
|--------------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| LC | 100 | 130 | 130 | 130 | 130 | 130 | 130 |
| LZ | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| LA | 115 | 145 | 145 | 145 | 145 | 145 | 145 |
| S | 22 (+0/-0.013) | 22 (+0/-0.013) | 22 (+0/-0.013) | 22 (+0/-0.013) | 22 (+0/-0.013) | 22 (+0/-0.013) | 22 (+0/-0.013) |
| LB | 95 (+0/-0.035) | 110 (+0/-0.035) | 110 (+0/-0.035) | 110 (+0/-0.035) | 110 (+0/-0.035) | 110 (+0/-0.035) | 110 (+0/-0.035) |
| LL(with out brake) | 153.3 | 147.5 | 167.5 | 187.5 | 152.5 | 187.5 | 202 |
| LL(with brake) | 192.5 | 183.5 | 202 | 216 | 181 | 216 | 230.7 |
| LS | 37 | 47 | 47 | 47 | 47 | 47 | 47 |
| LR | 45 | 55 | 55 | 55 | 55 | 55 | 55 |
| LE | 5 | 6 | 6 | 6 | 6 | 6 | 6 |
| LG | 12 | 11.5 | 11.5 | 11.5 | 11.5 | 11.5 | 11.5 |
| LW | 32 | 36 | 36 | 36 | 36 | 36 | 36 |
| RH | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| WK | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| W | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| T | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| TP | M6 Depth 20 | M6 Depth 20 | M6 Depth 20 | M6 Depth 20 | M6 Depth 20 | M6 Depth 20 | M6 Depth 20 |

Note: Note: In servo motor model names, □ signifies encoder type, □ signifies shaft diameter and oil seal, and □ signifies special code

Servo Motor Dimensions

ECMC Series

Frame Size 180 mm



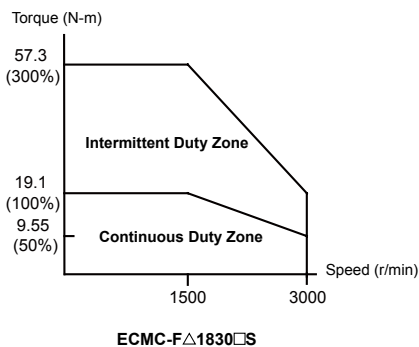
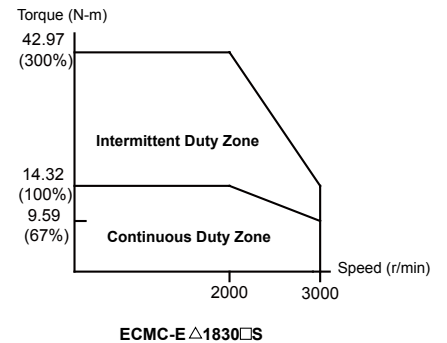
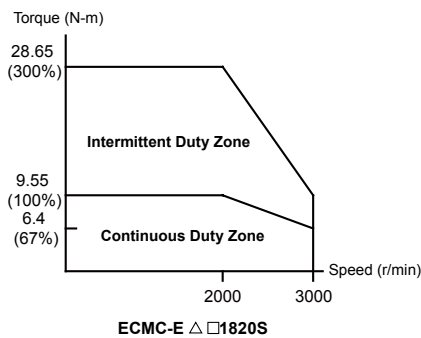
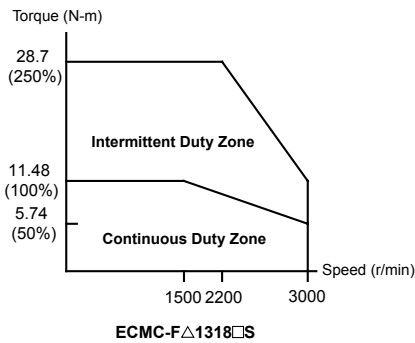
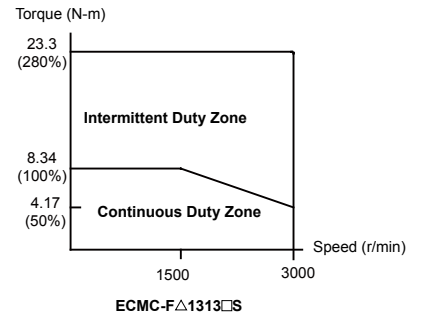
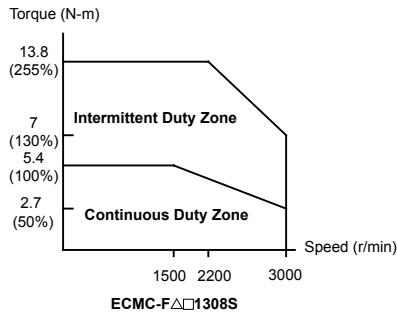
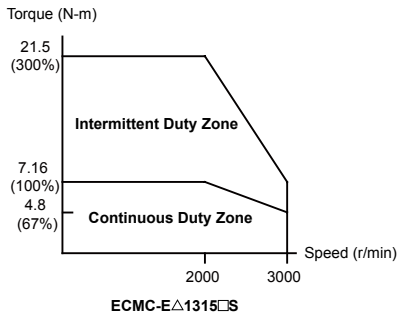
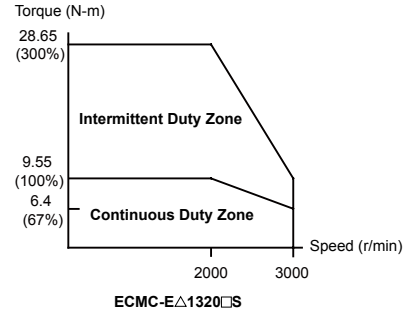
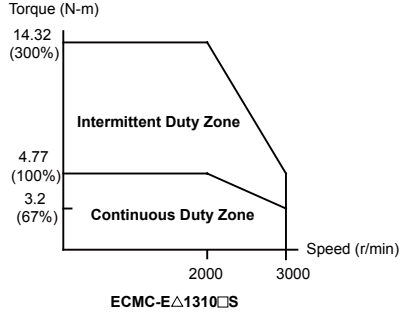
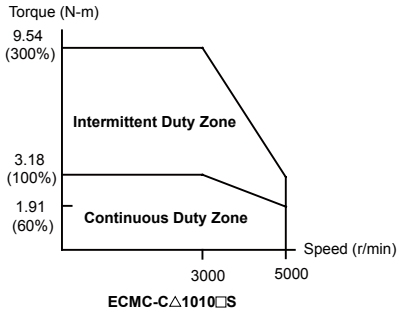
Units: mm

| Model | E □ 1820 □ □ □ | E □ 1830 □ □ □ | F □ 1830 □ □ □ |
|--------------------|---|---|---|
| LC | 180 | 180 | 180 |
| LZ | 13.5 | 13.5 | 13.5 |
| LA | 200 | 200 | 200 |
| S | 35 ⁺⁰ / _{-0.016} | 35 ⁺⁰ / _{-0.016} | 35 ⁺⁰ / _{-0.016} |
| LB | 114.3 ⁺⁰ / _{-0.035} | 114.3 ⁺⁰ / _{-0.035} | 114.3 ⁺⁰ / _{-0.035} |
| LL(with out brake) | 169 | 202.1 | 202.1 |
| LL(with brake) | 203.1 | 235.3 | 235.3 |
| LS | 73 | 73 | 73 |
| LR | 79 | 79 | 79 |
| LE | 4 | 4 | 4 |
| LG | 20 | 20 | 20 |
| LW | 63 | 63 | 63 |
| RH | 30 | 30 | 30 |
| WK | 10 | 10 | 10 |
| W | 10 | 10 | 10 |
| T | 8 | 8 | 8 |
| TP | M12 Depth 25 | M12 Depth 25 | M12 Depth 25 |

Note: In servo motor model names, □ signifies encoder type, □ signifies shaft diameter and oil seal, and □ signifies special code

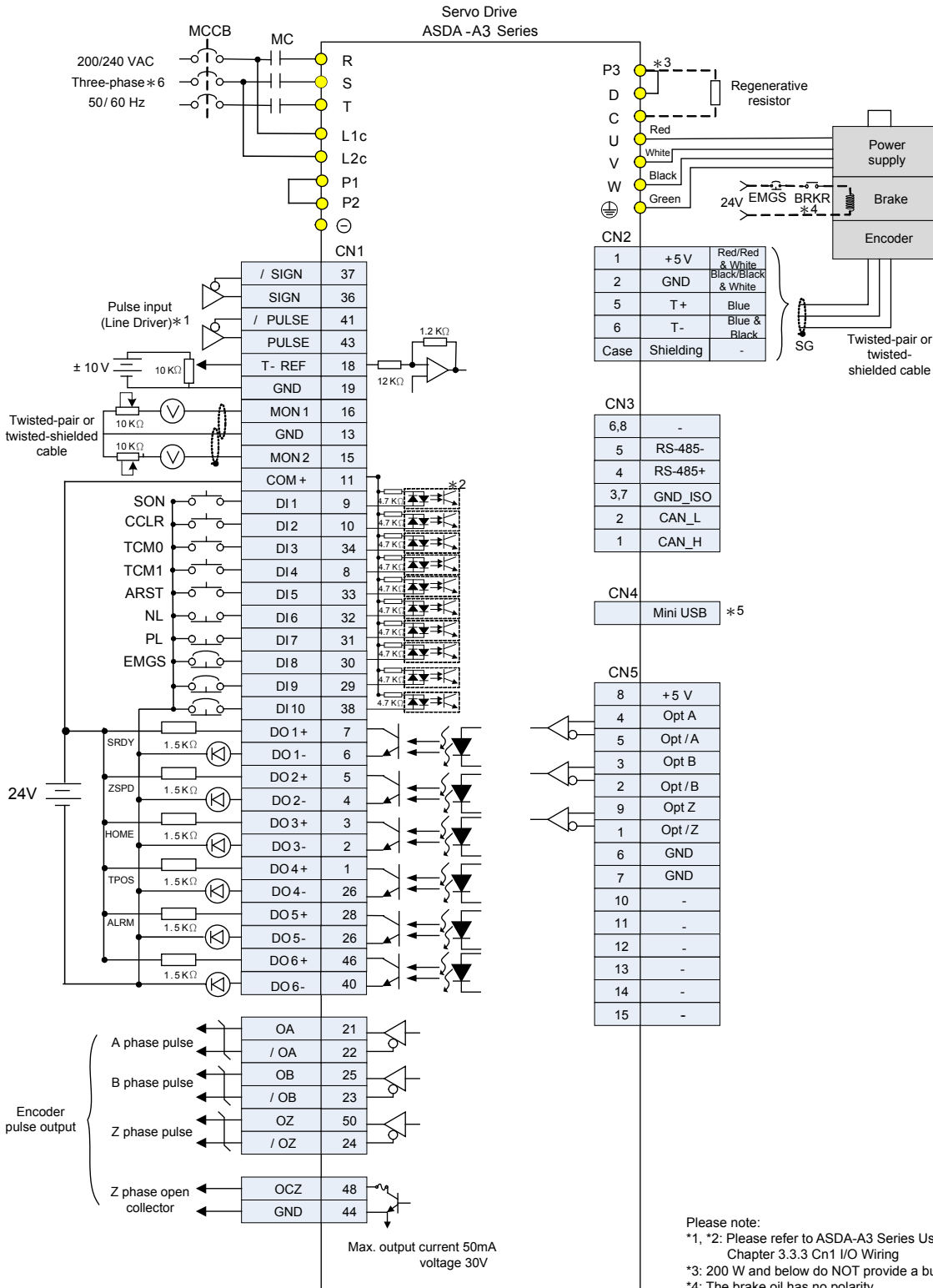
Speed-Torque Curves (T-N Curves)

ECMC Torque Features



Wiring

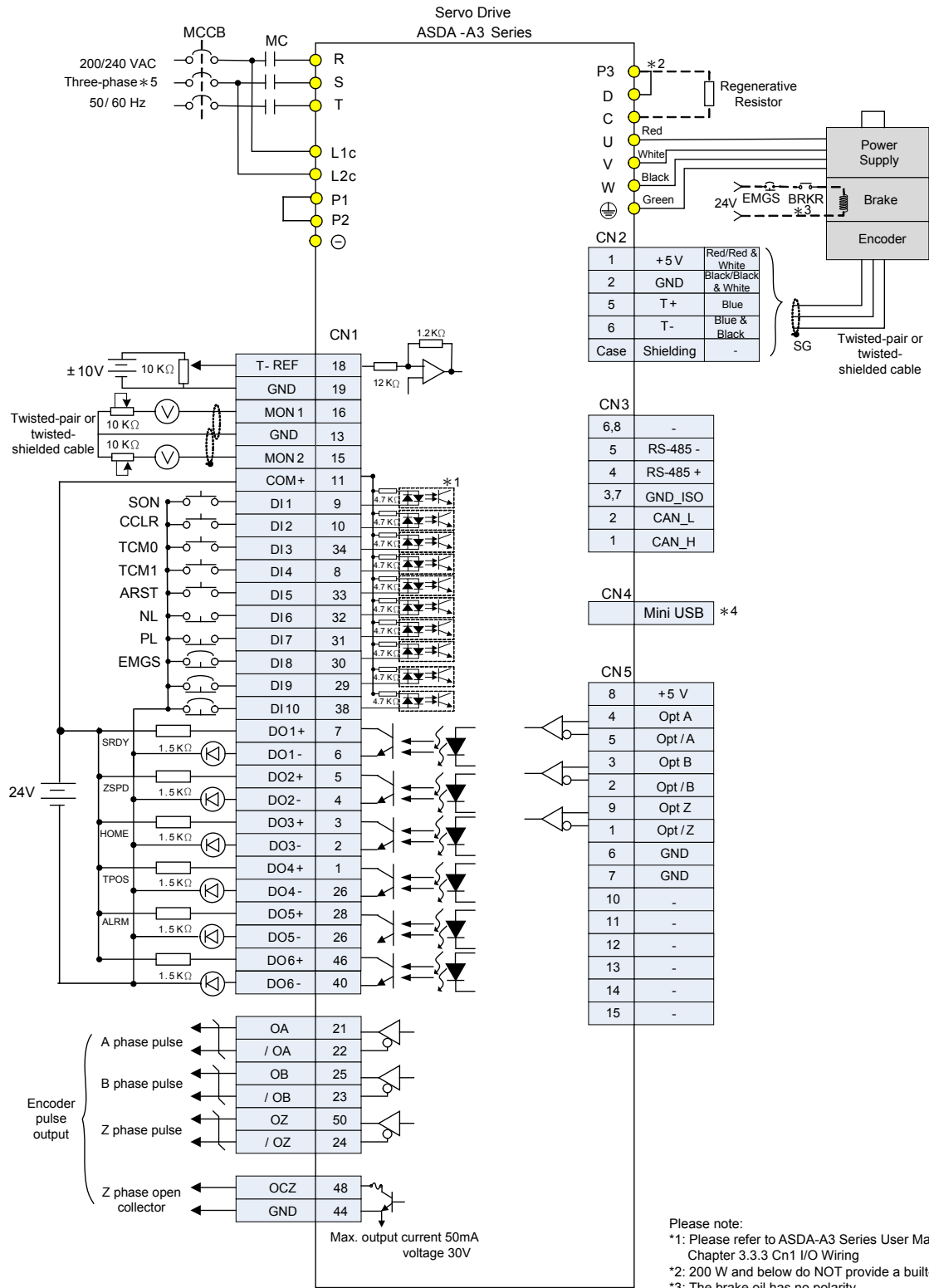
Position (PT) Control Mode (for pulse command input)



Please note:
 *1, *2: Please refer to ASDA-A3 Series User Manual, Chapter 3.3.3 Cn1 I/O Wiring
 *3: 200 W and below do NOT provide a built-in regenerative resistor
 *4: The brake oil has no polarity
 *5: Connect to Mini-USB of PC
 *6: Single-phase connections are for servo drives 1.5kW and below only.

Wiring

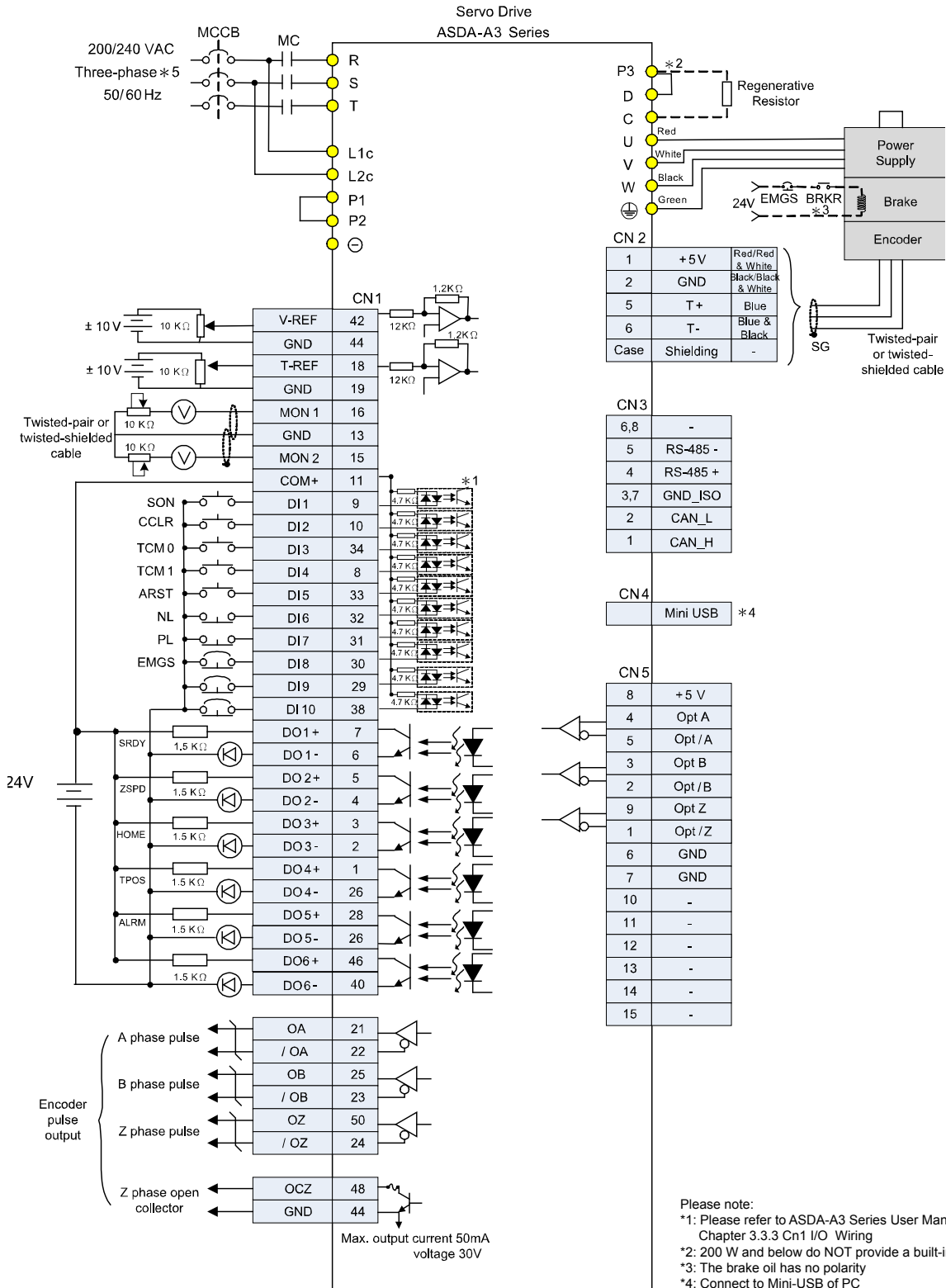
Position (PR) Control Mode (for Internal Procedure Control)



- Please note:
- *1: Please refer to ASDA-A3 Series User Manual, Chapter 3.3.3 Cn1 I/O Wiring
 - *2: 200 W and below do NOT provide a built-in regenerative resistor
 - *3: The brake oil has no polarity
 - *4: Connect to Mini-USB of PC
 - *5: Single-phase connections are for servo drives 1.5kW and below only

Wiring

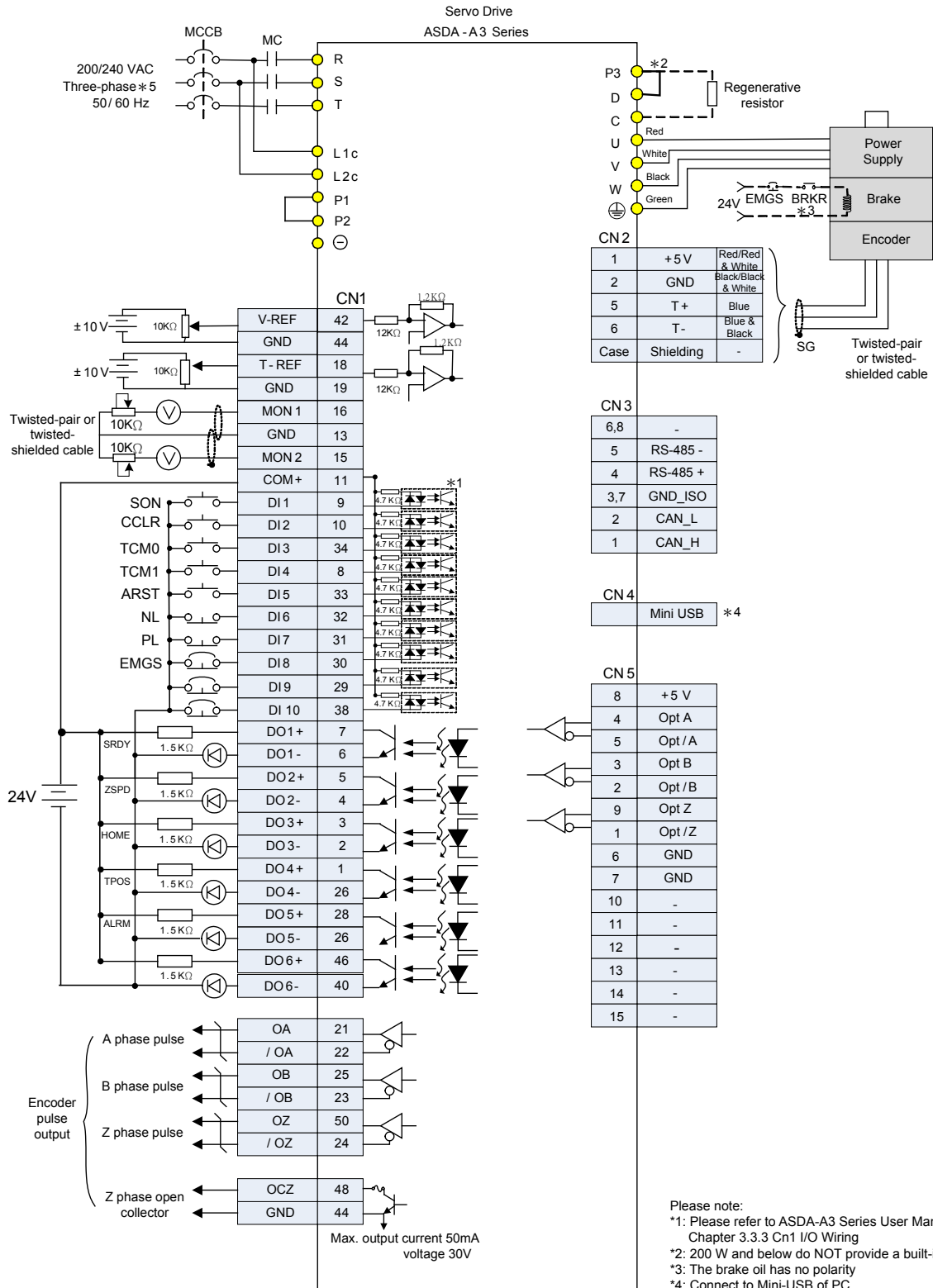
Torque (T) Mode Standard Wiring (for Analog Voltage Input and Internal Parameter Setting)



Please note:
 *1: Please refer to ASDA-A3 Series User Manual, Chapter 3.3.3 Cn1 I/O Wiring
 *2: 200 W and below do NOT provide a built-in regenerative resistor
 *3: The brake oil has no polarity
 *4: Connect to Mini-USB of PC
 *5: Single-phase connections are for servo drives 1.5kW and below only

Wiring

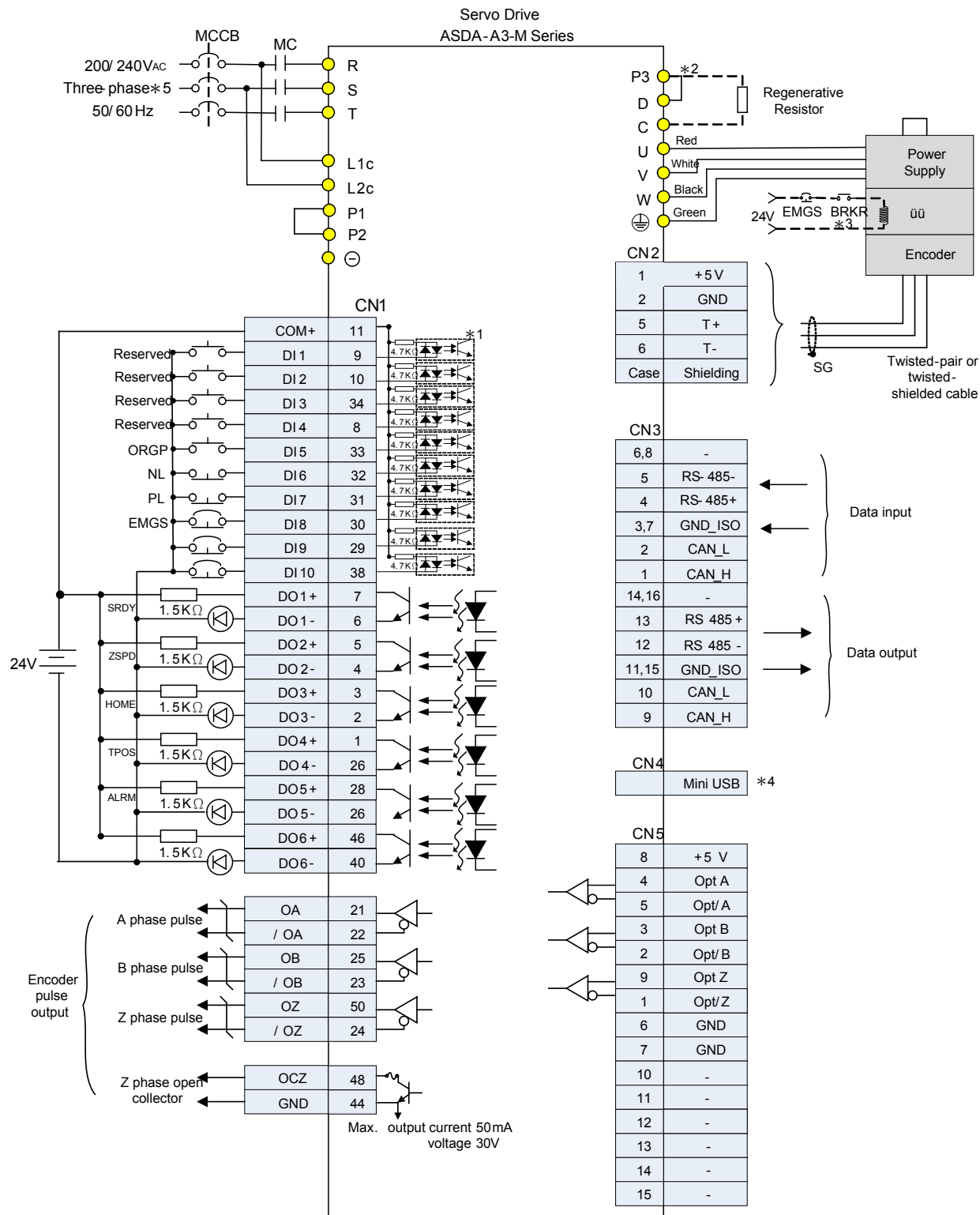
Speed (S) Mode (for Analog Voltage Input and Internal Parameter Setting)



Please note:
 *1: Please refer to ASDA-A3 Series User Manual, Chapter 3.3.3 Cn1 I/O Wiring
 *2: 200 W and below do NOT provide a built-in regenerative resistor
 *3: The brake oil has no polarity
 *4: Connect to Mini-USB of PC
 *5: Single-phase connections are for servo drives 1.5kW and below only

Wiring

Communication mode (CANopen)

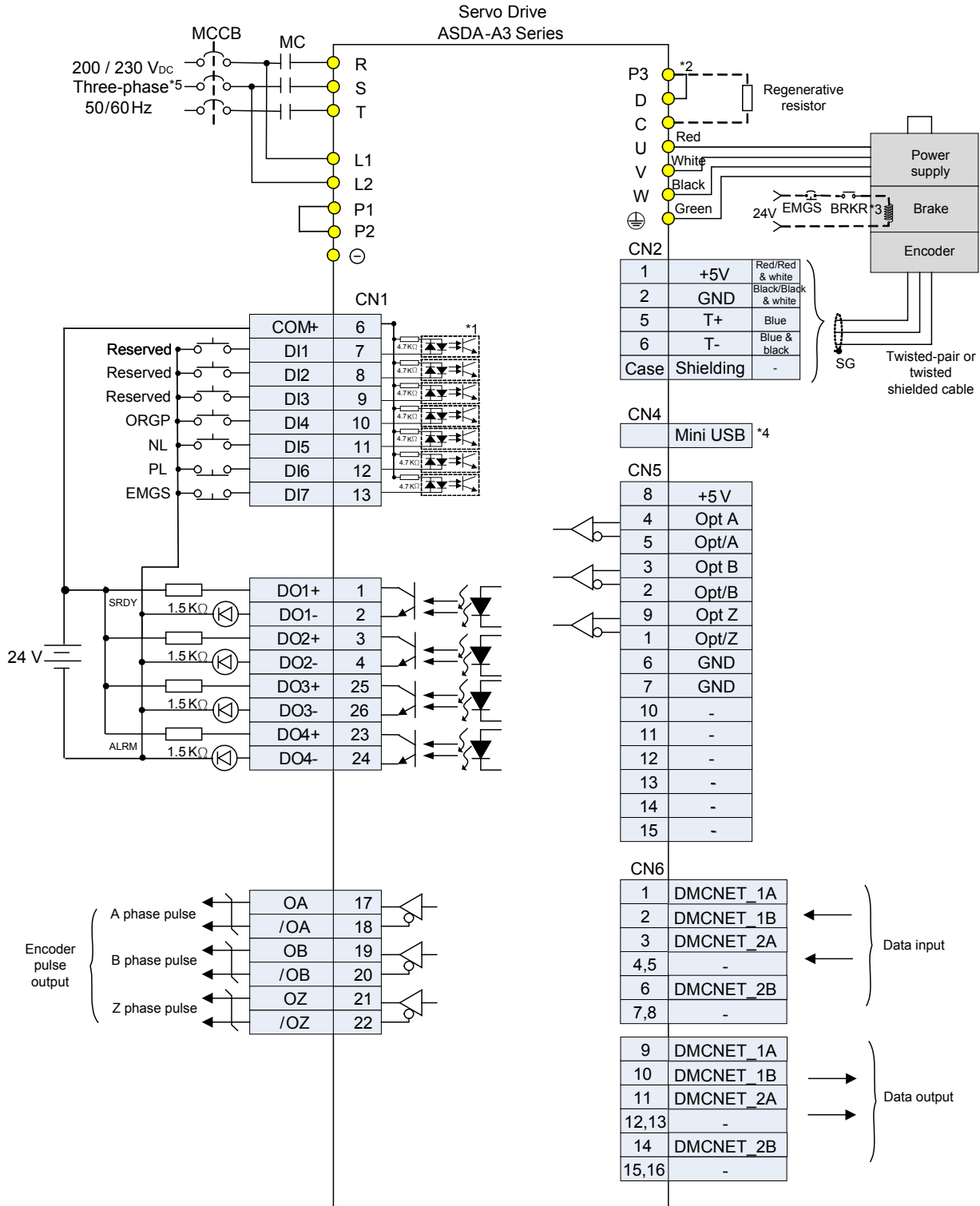


Please note:

- *1: Please refer to ASDA-A3 Series User Manual, Chapter 3.3.3 Cn1 I/O Wiring
- *2: 200 W and below do NOT provide a built-in regenerative resistor
- *3: The brake oil has no polarity
- *4: Connect to Mini-USB of PC
- *5: Single-phase connections are for servo drives 1.5kW and below only

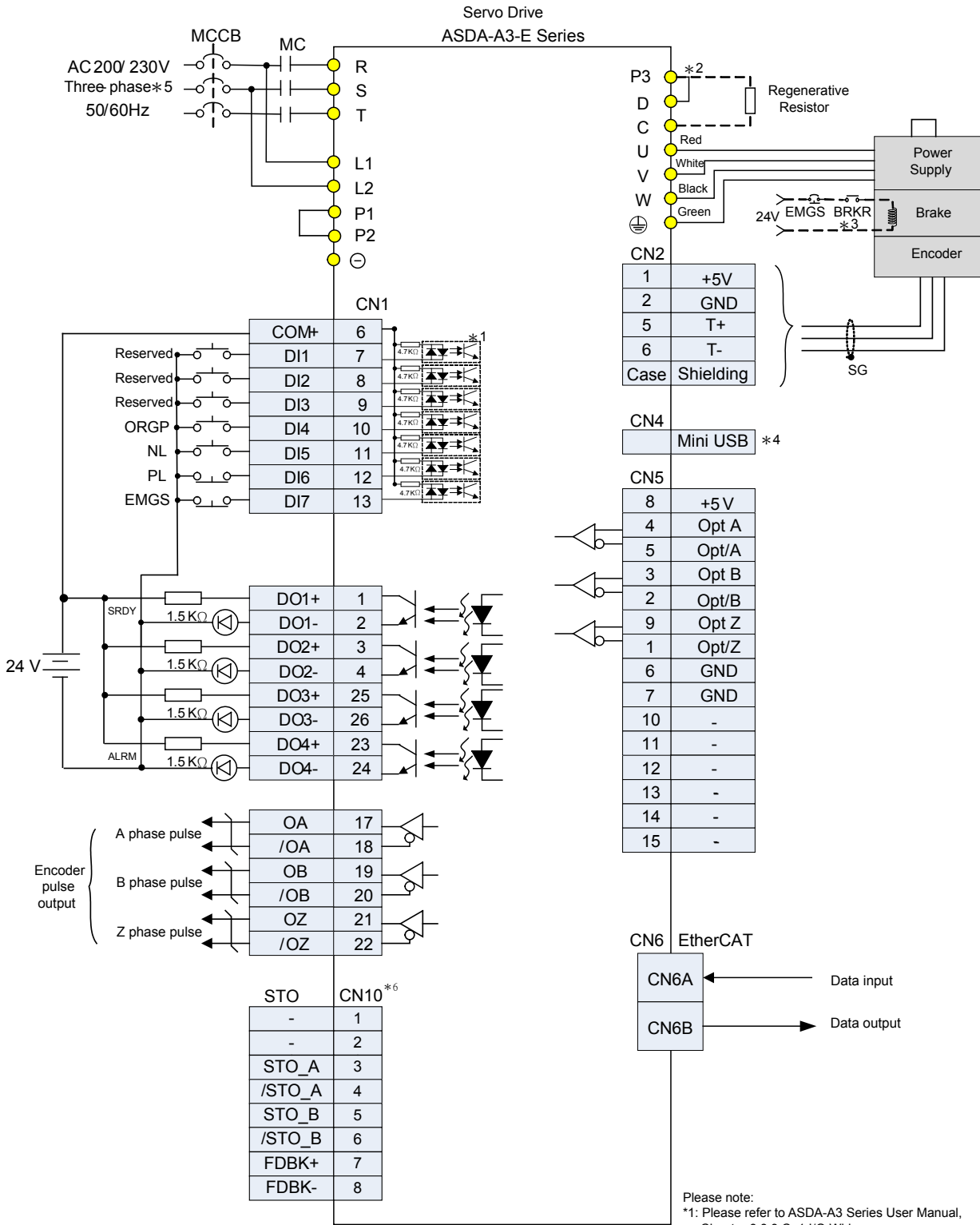
Wiring

Communication mode (DMCNET)



Please note:
 *1: Please refer to ASDA-A3 Series User Manual, Chapter 3.3.3 Cn1 I/O Wiring
 *2: 200 W and below do NOT provide a built-in regenerative resistor
 *3: The brake oil has no polarity
 *4: Connect to Mini-USB of PC
 *5: Single-phase connections are for servo drives 1.5kW and below only

Communication mode (EtherCAT)



Please note:
 *1: Please refer to ASDA-A3 Series User Manual, Chapter 3.3.3 Cn1 I/O Wiring
 *2: 200 W and below do NOT provide a built-in regenerative resistor
 *3: The brake coil has no polarity
 *4: Connect to Mini-USB of PC
 *5: Single-phase connections are for servo drives 1.5kW and below only



Part Names and Functions

- **Control Circuit Input Terminal (L1, L2)**

- L1 and L2 are used to connect 200~230 VAC, 50/60 Hz single-phase power supply

- **DC Reactor (P1, P2)**

- Without DC reactor: Short circuit P1 and P2
- With DC reactor: connect to P1 and P2

- **Main Circuit Input Terminal (R,S,T)**

- R, S, T are used to connect to main circuit of the servo drive
- For 100 W ~ 1.5 kW servo drives: Used to connect 200 ~ 230 VAC, 50/60 Hz single- phase or 3-phase power supply
- For 2 kW ~ 3 kW servo drives: Used to connect 200-230 VAC, 50/60 Hz 3-phase power supply

- **STO (Safe Torque Off)**

*Note: The STO function is applicable for the -M/-E models

- STO switch
- Connect to safety switch

- **PC Connection Port (CN4)**

- Used to connect PCs or notebooks for operating ASDA-SOFT software
- A mini-USB Type B port (Note: combine Delta's USB communication modules, see p.48 for reference)
- (Note: combine Delta's USB communication modules, see chapter on accessories for reference)

- **RS-485/ CANopen Communication Port Connector (CN3)**

- MODBUS communication control for RS-485
- CANopen communication control
- (Note: CANopen series with two communication ports, see p.31 for reference)

- **I / O Connector (CN1)**

- Used to connect Delta's PLC products or other NC controllers

- **Encoder Connector (CN2)**

- Used to connect the encoder of the servo motor

- **Extension Module (CN9)**





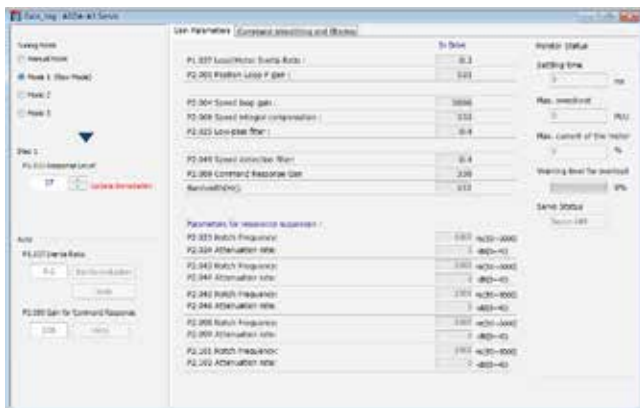
- **Full-Closed Loop Control Terminal (CN5)**
 - Used to connect external linear scale or encoder for receiving A,B,Z phase signals
- **Servo Motor Output (UVW)**
 - Used to connect servo motor terminal U, V, W. Never connect the output terminal to main circuit power as the AC drive may be damaged beyond repair if incorrect cable are connected to the output terminals
- **Braking Resistor Terminal (P3 DC)**
 - Adopt internal resistor: Ensure the circuit is closed between P3 and D, and the circuit is open between P3 and C (Note: Please refer to table of regenerative resistor specifications for the models with a built-in regenerative resistor from ASDA-A3 User Manual Chapter 2 Selecting Regenerative Resistors)
 - Adopt external resistor: Connect it to P3 and C, and ensure an open circuit between P3 and D
 - When using an external braking unit, connect it to P2 and ensure an open circuit between P3 and D, and P3 and C
- **Ground Terminal**
 - Used to connect grounding wire of power supply and servo motor
- **Heat sink**
 - Used to secure the servo drive and for heat dissipation

ASDA-Soft Configuration Software



Auto-Tuning Function

- Step-to-step guide on using the auto tuning function
- Flow chart of the setting procedure and tuning progress
- Compare the tuning results (before & after)
- Downloadable gain parameters



Advanced Tuning Function

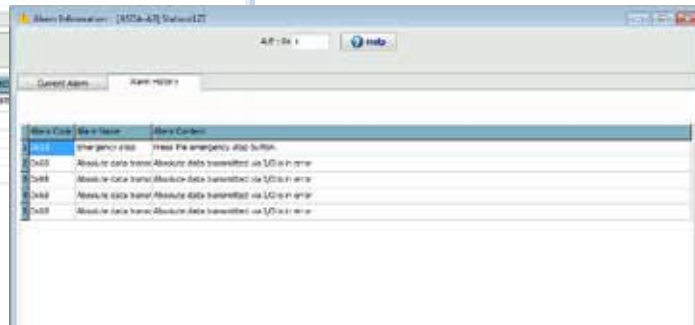
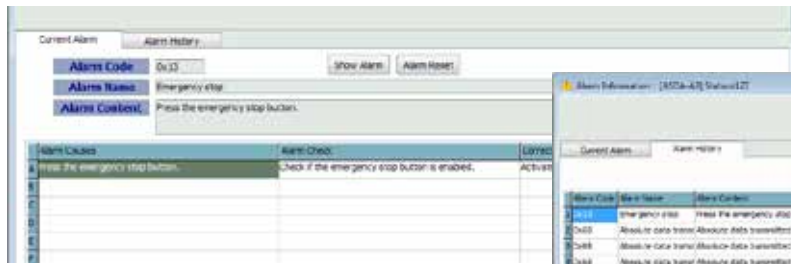
- Four tuning modes available
- Manual mode: All gains tuned manually, which is for those who has profound knowledge of servo gain adjustment
- Mode 1: For fine-tuning the bandwidth
- Mode 2: For fine-tuning the inertia and bandwidth
- Mode 3: For fine-tuning the inertia, bandwidth and command responsiveness



System Module and Low Frequency Analysis

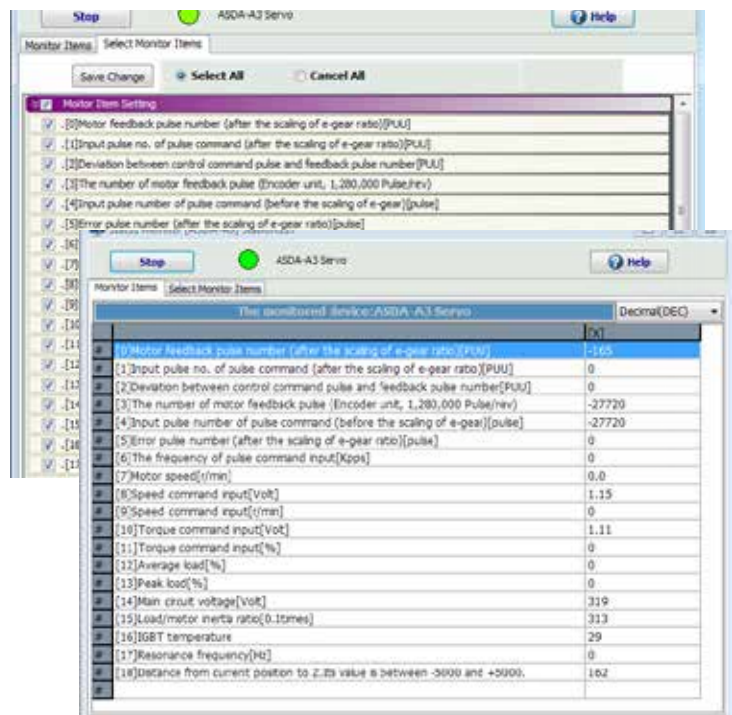
- Provide analysis on rigidity of the system
- Acquire the low-frequency resonance data and automatically set the relevant parameters to eliminate the vibration with just one click
- Collect data such as inertia, elasticity and viscous friction coefficient for knowing the mechanism's features and wear condition





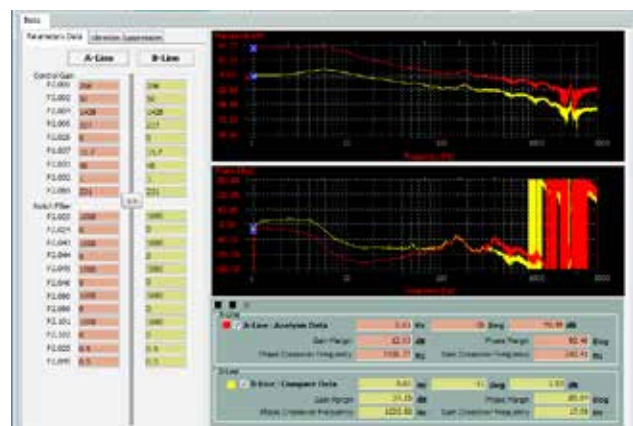
Alarm Information

- Display current alarm and alarm log
- Provide simple corrective actions for quick troubleshooting



Condition Monitoring

- Real-time display of servo motor operation status via the monitoring list



Speed Open-Loop Mode

- Acquire the gain condition for optimizing the equipment performance
- Check the system stability via monitoring the gain and phase margins

Optional Accessories

- **Quick Connectors**

- Used for 100W to 3kW servo drives
- One operating lever is provided for wiring



- **Power Cables**

- 3 m and 5 m standard cables are available
- Two types are selectable: with brake and without brake



- **Encoder Cables**

- 3 m and 5 m standard cables are available





- **Regenerative Resistor**

- For selecting a regenerative resistor, please refer to ASDA-A3 User Manual, Chapter 2.9 Selecting Regenerative Resistor



- **USB Communication Cables (for PC)**



- USB Communication Cables (for PC)
- USB1.1 is equipped as standard



- **CANopen Accessories**

- Connect to Delta PLC CAN Master with TAP-CN03 distribution box
- CANopen communication cable is provided

Servo Drive Specifications

| ASDA-A3 | | 100 W | 200 W | 400 W | 750 W | 1 kW | 1.5 kW | 2 kW | 3 kW | |
|--|---|--|--|-------|----------|-------------|--------|-----------------------------------|-------|--|
| | | 01 | 02 | 04 | 07 | 10 | 15 | 20 | 30 | |
| Power supply | Phase / Voltage | Single-phase / three-phase 220 VAC | | | | | | Three-phase 220 VAC | | |
| | Permissible Voltage Range | Single-phase / three-phase 200~230 VAC, -15%~10% | | | | | | Three-phase 200~230 VAC, -15%~10% | | |
| | Input Current(3PH) (Units: Arms) | 0.67 | 1.34 | 2.67 | 5.01 | 6.68 | 10.02 | 13.36 | 20.05 | |
| | Input Current(1PH) (Units: Arms) | 1.16 | 2.31 | 4.63 | 8.68 | 11.57 | 17.36 | - | - | |
| | Continuous Output Current (Units: Arms) | 0.9 | 1.55 | 2.65 | 5.1 | 7.3 | 12.6 | 13.4 | 19.4 | |
| Instantaneous Maximum Output Current (Units: Arms) | | 3.54 | 7.07 | 10.61 | 21.21 | 24.75 | 35.36 | 53.03 | 70.71 | |
| Cooling System | | Natural Air Circulation | | | | Fan Cooling | | | | |
| Drive resolution | | 24-bit (16777216 p/rev) | | | | | | | | |
| Control of Main Circuit | | SVPWM Control | | | | | | | | |
| Tuning Modes | | Auto / Manual | | | | | | | | |
| Regenerative Resistor | | None | | | Built-in | | | | | |
| Position Control Mode | Pulse Type (Only for Non-DMCNET mode) | Pulse + Direction, A phase + B + CW pulse | | | | | | | | |
| | Max. Input Pulse Frequency (Only for Non-DMCNET mode) | Pulse + Direction: 4Mpps ; CCW pulse + CW pulse: 4Mpps ; A phase + B phase: Single phase 4Mpps ; Max. 200Kpps (Open collector)pps | | | | | | | | |
| | 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: 1~536870911, M: 1~2147483647 (1/4 < N/M < 262144) | | | | | | | | |
| | 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 V _{DC} | | | | | | | |
| | | Resolution | 15-bit | | | | | | | |
| | | Input Resistance | 1MΩ | | | | | | | |
| | | Time Constant | 25 μs | | | | | | | |
| | Speed Control Range ** | 1 : 6000 | | | | | | | | |
| | 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 analog input (Only for Non-DMCNET mode) | | | | | | | | |
| Torque Control Mode | Frequency Response Characteristic | Maximum 3.1kHz | | | | | | | | |
| | Speed Accuracy ² | 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 (Only for Non-DMCNET mode) | Voltage Range | 0 ~ ±10 V _{DC} | | | | | | | |
| | | Input Resistance | 1MΩ | | | | | | | |
| | | Time Constant | 25 μs | | | | | | | |
| | Command Source | External analog signal (Only for Non-DMCNET mode) / Internal parameters | | | | | | | | |
| Digital Inputs / Outputs | Smoothing Strategy | Low-pass filter | | | | | | | | |
| | Speed Limit | Set by parameters or 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-485 / CANopen / USB | | | | | | | | |
| Environment | Installation Site | | Indoor environment (free of direct sunlight), no corrosive liquid and gas (free of oil mist, flammable gas, or 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 °C ~ 65 °C | | | | | | | |
| | Humidity | | 0 ~ 90% RH (non-condensing) | | | | | | | |
| | Vibration | | 9.80665 m/s ² (1G) less than 20Hz, 5.88 m/s ² (0.6G) 20 to 50Hz | | | | | | | |
| | IP Rating | | IP20 | | | | | | | |
| Power System | | TN System ^{3,4} | | | | | | | | |
| Approvals | | IEC/EN 61800-5-1 · UL 508C   | | | | | | | | |

Note: *1. When it is with the rated load, the speed ratio is: the minimum speed (smooth operation) / rated speed.

*2. When the command is the rated speed, the velocity correction ratio is: (free run speed - full load speed) / rated speed

*3. TN system: The neutral point of the power system connects to the ground directly. The exposed metal components connect to the ground via the protective earth conductor.

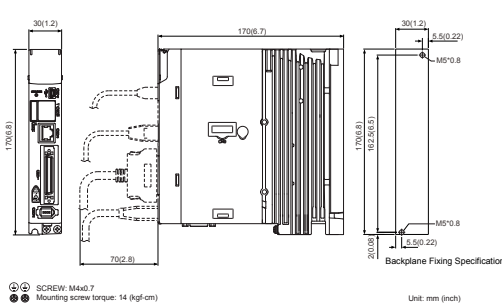
*4. Use a single-phase three-wire power systems for models of single-phase power

Servo Drive Dimensions

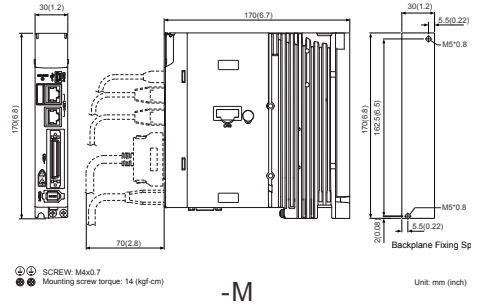
Frame A

100W / 200W

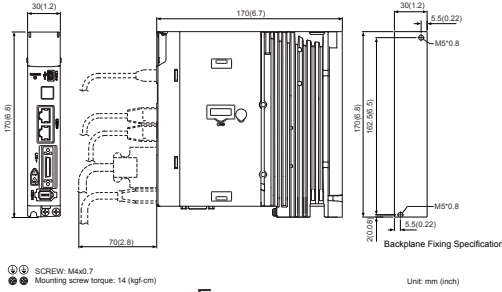
Weight
0.84 kg



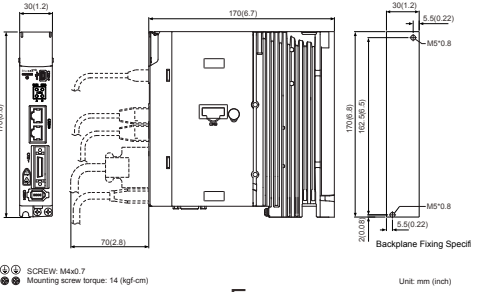
-L



-M



-F

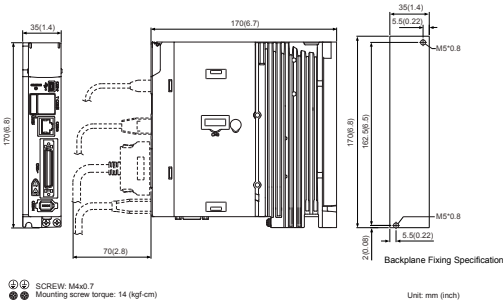


-E

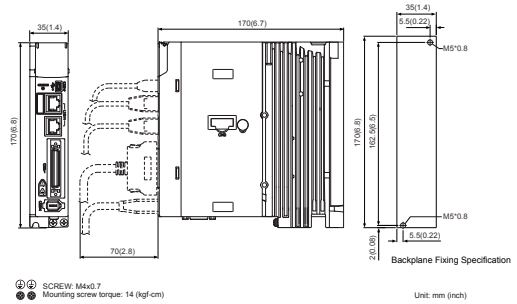
Frame B

400W

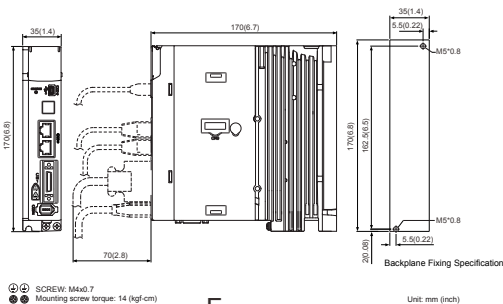
Weight
0.92kg



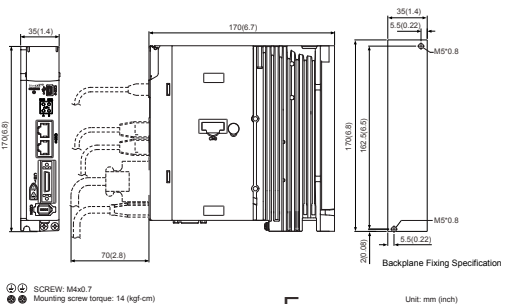
-L



-M



-F



-E

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



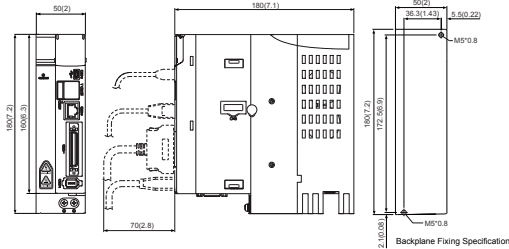
Servo Drive Dimensions

Unit: mm [inch]

Frame C

750W / 1kW / 1.5kW

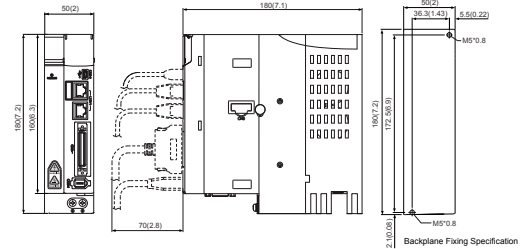
Weight
1.3kg



④④ SCREW: M4x0.7
●● Mounting screw torque: 14 (kgf-cm)

Unit: mm (inch)

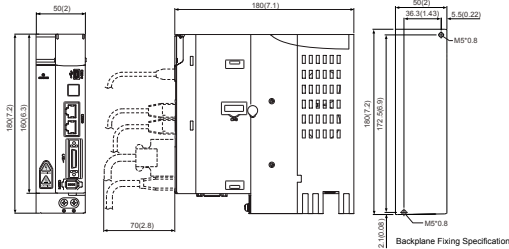
-L



④④ SCREW: M4x0.7
●● Mounting screw torque: 14 (kgf-cm)

Unit: mm (inch)

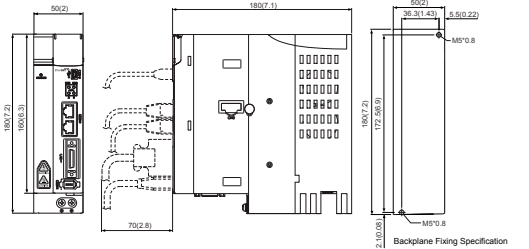
-M



④④ SCREW: M4x0.7
●● Mounting screw torque: 14 (kgf-cm)

Unit: mm (inch)

-F



④④ SCREW: M4x0.7
●● Mounting screw torque: 14 (kgf-cm)

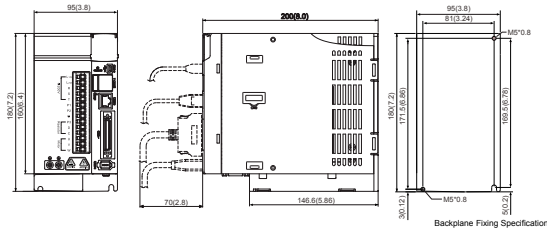
Unit: mm (inch)

-E

Frame D

2kW / 3kW

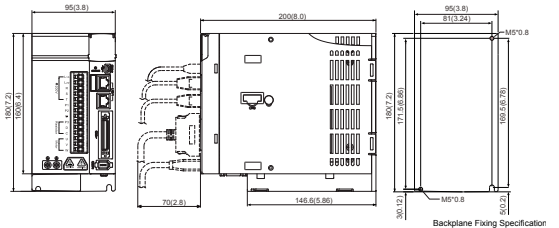
Weight
2.7kg



④④ SCREW: M4x0.7
●● Mounting screw torque: 14 (kgf-cm)

Unit: mm (inch)

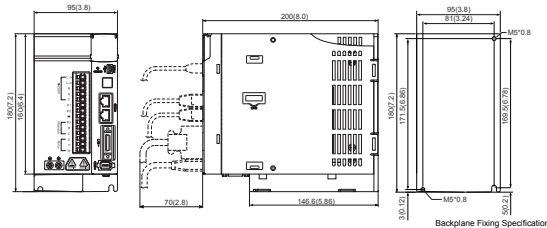
-L



④④ SCREW: M4x0.7
●● Mounting screw torque: 14 (kgf-cm)

Unit: mm (inch)

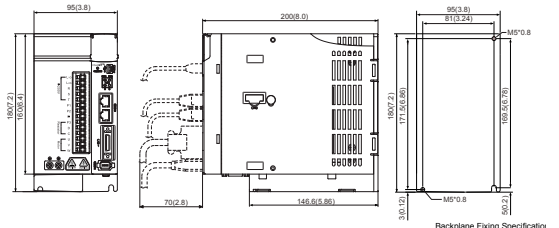
-M



④④ SCREW: M4x0.7
●● Mounting screw torque: 14 (kgf-cm)

Unit: mm (inch)

-F



④④ SCREW: M4x0.7
●● Mounting screw torque: 14 (kgf-cm)

Unit: mm (inch)

-E

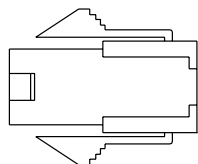
Note:

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

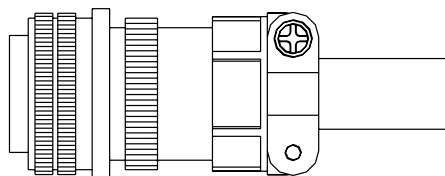
Optional Cables and Connectors

• Power Connectors

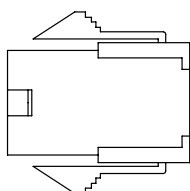
ASDBCAPW0000 (for 200V drives)



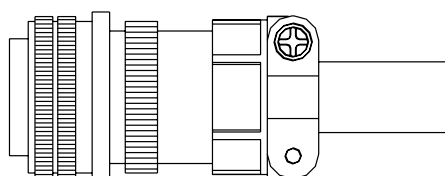
ASD-CAPW1000



ASDBCAPW0100 (for 200V drives, with brake cable)

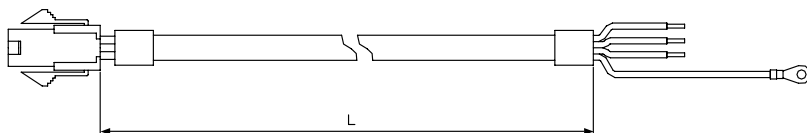


ASD-CAPW2000



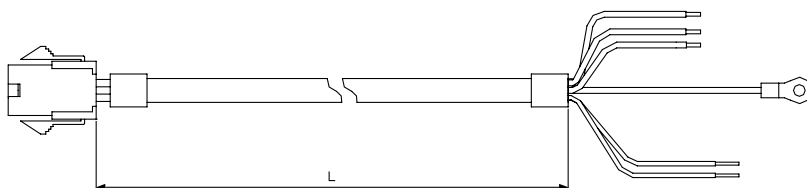
• Power Cables

ACS3-CAPW1103, ACS3-CAPW1105 (for 200V drives)



| Item | Part No. | L | |
|------|---------------|------------|---------|
| | | mm | inch |
| 1 | ACS3-CAPW1103 | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAPW1105 | 5000 ± 100 | 197 ± 4 |

ACS3-CAPW2103, ACS3-CAPW2105 (for 200V drives, with brake cable)

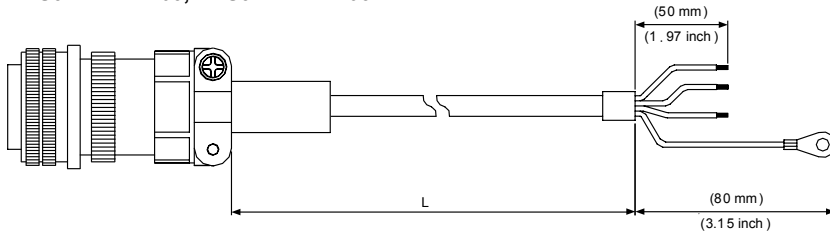


| Item | Part No. | L | |
|------|---------------|------------|---------|
| | | mm | inch |
| 1 | ACS3-CAPW2103 | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAPW2105 | 5000 ± 100 | 197 ± 4 |

Optional Cables and Connectors

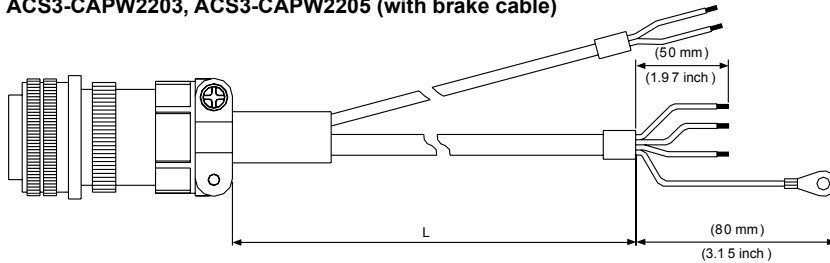
• Power Cables

ACS3-CAPW1203, ACS3-CAPW1205



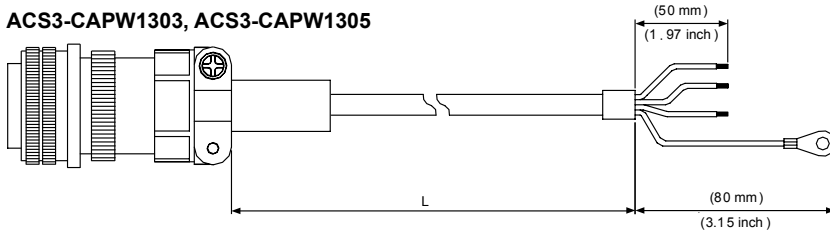
| Item | Part No. | Straight | L | |
|------|---------------|--------------|------------|---------|
| | | | mm | inch |
| 1 | ACS3-CAPW1203 | 3106A-20-18S | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAPW1205 | 3106A-20-18S | 5000 ± 100 | 197 ± 4 |

ACS3-CAPW2203, ACS3-CAPW2205 (with brake cable)



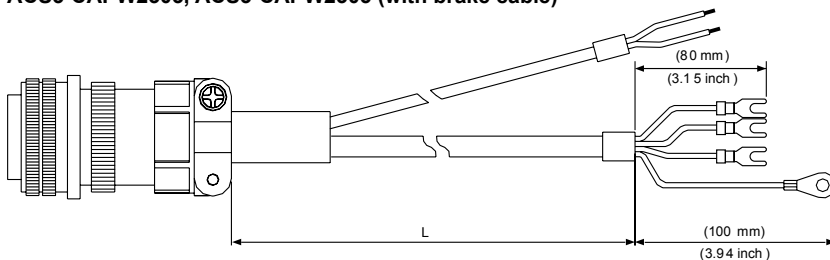
| Item | Part No. | Straight | L | |
|------|---------------|--------------|------------|---------|
| | | | mm | inch |
| 1 | ACS3-CAPW2203 | 3106A-20-18S | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAPW2205 | 3106A-20-18S | 5000 ± 100 | 197 ± 4 |

ACS3-CAPW1303, ACS3-CAPW1305



| Item | Part No. | Straight | L | |
|------|---------------|--------------|------------|---------|
| | | | mm | inch |
| 1 | ACS3-CAPW1303 | 3106A-20-18S | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAPW1305 | 3106A-20-18S | 5000 ± 100 | 197 ± 4 |

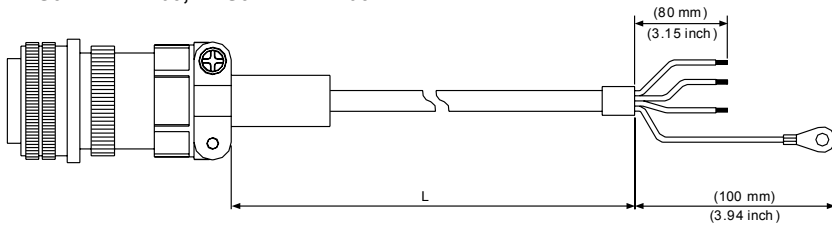
ACS3-CAPW2303, ACS3-CAPW2305 (with brake cable)



| Item | Part No. | Straight | L | |
|------|---------------|--------------|------------|---------|
| | | | mm | inch |
| 1 | ACS3-CAPW2303 | 3106A-20-18S | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAPW2305 | 3106A-20-18S | 5000 ± 100 | 197 ± 4 |

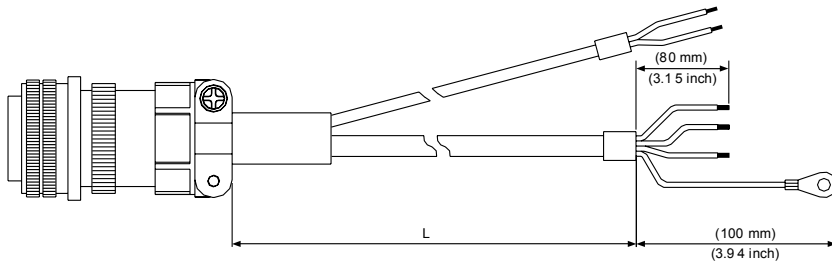
• Power Cables

ACS3-CAPW1403, ACS3-CAPW1405



| Item | Part No. | Straight | L | |
|------|---------------|--------------|------------|---------|
| | | | mm | inch |
| 1 | ACS3-CAPW1403 | 3106A-24-11S | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAPW1405 | 3106A-24-11S | 5000 ± 100 | 197 ± 4 |

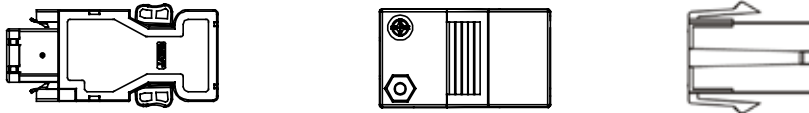
ACS3-CAPW2403, ACS3-CAPW2405 (with brake cable)



| Item | Part No. | Straight | L | |
|------|---------------|--------------|------------|---------|
| | | | mm | inch |
| 1 | ACS3-CAPW2403 | 3106A-24-11S | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAPW2405 | 3106A-24-11S | 5000 ± 100 | 197 ± 4 |

• Encoder Connectors

ACS-CNEN1100

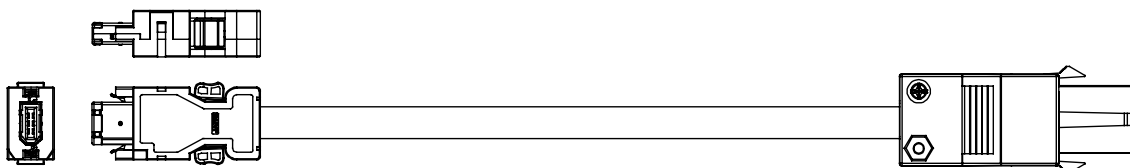


ACS-CNEN3100



• Incremental Encoder Cables

ACS3-CAEN1003, ACS3-CAEN1005

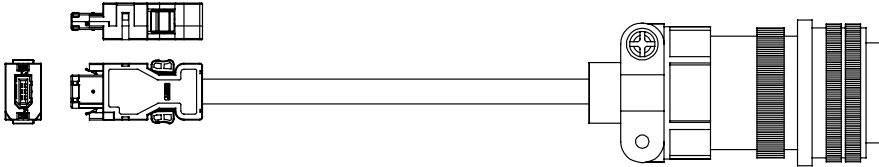


| Item | Part No. | L | |
|------|---------------|------------|---------|
| | | mm | inch |
| 1 | ACS3-CAEN1003 | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAEN1005 | 5000 ± 100 | 197 ± 4 |

Optional Cables and Connectors

• Incremental Encoder Cables

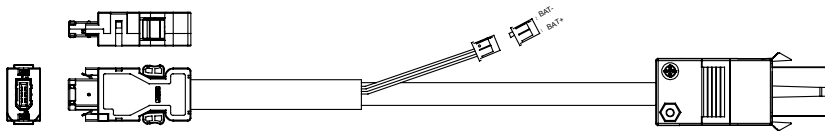
ACS3-CAEN3003, ACS3-CAEN3005



| Item | Part No. | Straight | L | |
|------|---------------|--------------|------------|---------|
| | | | mm | inch |
| 1 | ACS3-CAEN3003 | 3106A-20-29S | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAEN3005 | 3106A-20-29S | 5000 ± 100 | 197 ± 4 |

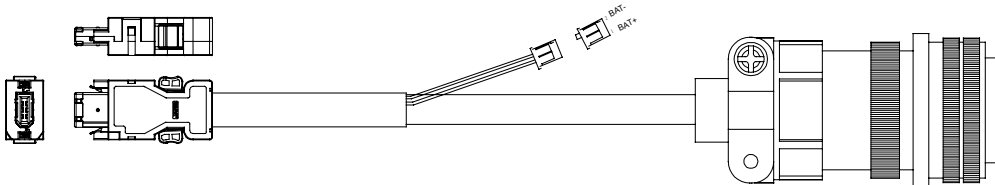
• Absolute Encoder Cables

ACS3-CAEA1003 · ACS3-CAEA1005



| Item | Part No. | L | |
|------|---------------|------------|---------|
| | | mm | inch |
| 1 | ACS3-CAEA1003 | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAEA1005 | 5000 ± 100 | 197 ± 4 |

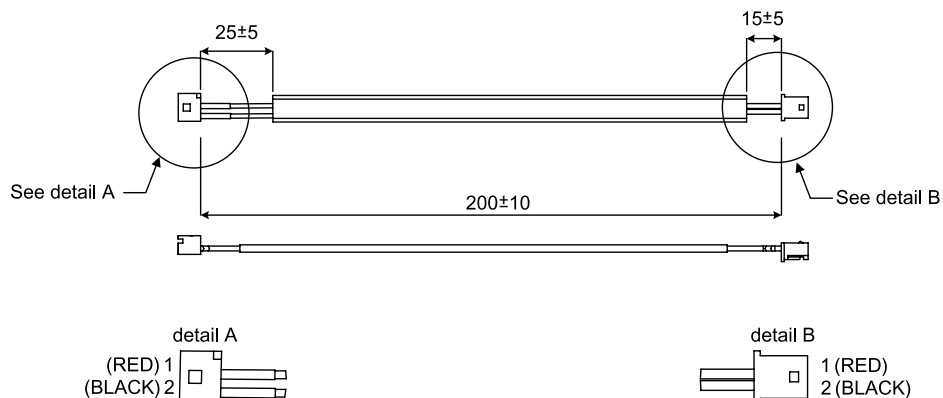
ACS3-CAEA3003 · ACS3-CAEA3005



| Item | Part No. | L | |
|------|---------------|------------|---------|
| | | mm | inch |
| 1 | ACS3-CAEA3003 | 3000 ± 100 | 118 ± 4 |
| 2 | ACS3-CAEA3005 | 5000 ± 100 | 197 ± 4 |

• Battery Box Cord AW (Connects to the battery side of the encoder cable) Units: mm

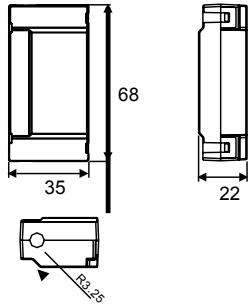
3864573700



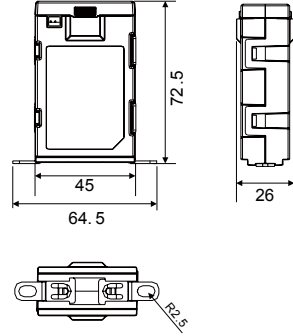
Unit:mm

• **Battery Boxes with batteries** Units: mm

Single Battery Box
ASD-MDBT0100

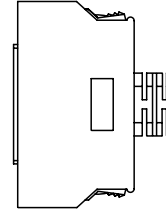


Dual Battery Box
ASD-MDBT0200



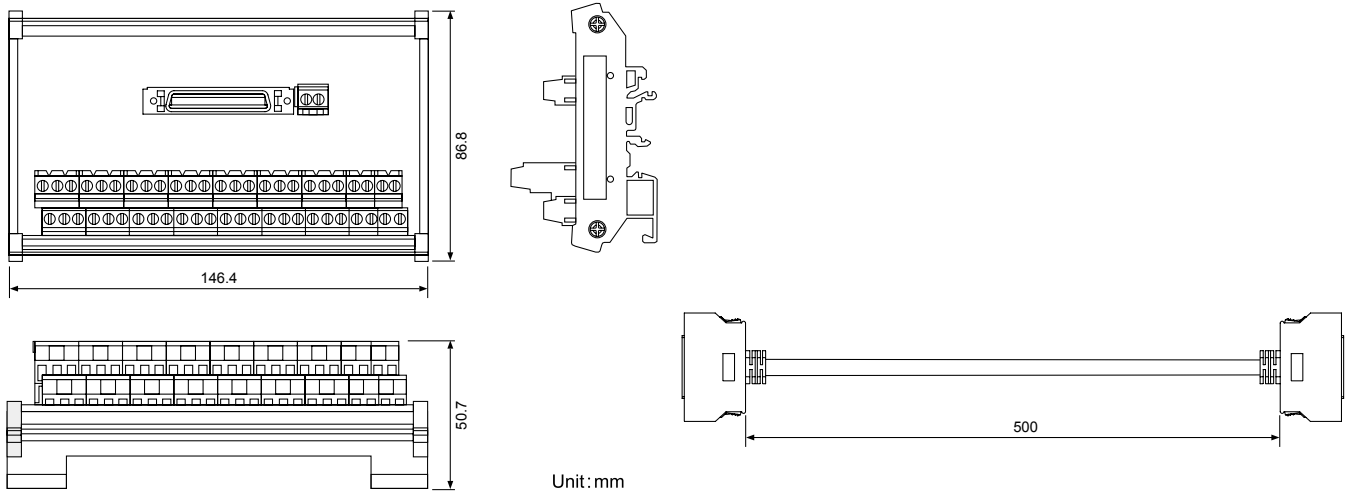
• **I/O Signal Connector (CN1)**

ACS3-CNADC150



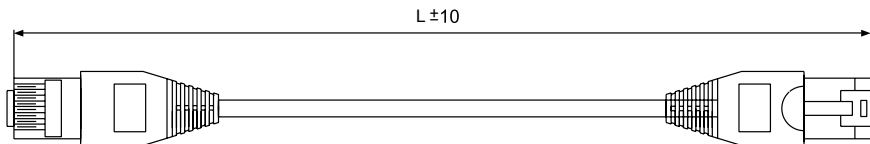
• **Terminal Block Module**

ACS3-MDTB5000



• **CANopen Communication Cable**

UC-CMC030-01A, UC-CMC050-01A

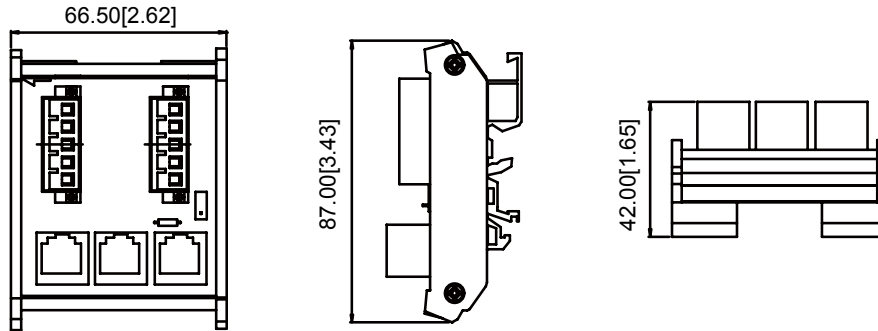


| Item | Part No. | L | |
|------|---------------|----------|----------|
| | | mm | inch |
| 1 | UC-CMC030-01A | 300 ± 10 | 11 ± 0.4 |
| 2 | UC-CMC050-01A | 500 ± 10 | 19 ± 0.4 |

Optional Cables and Connectors

• CANopen Distribution Box Units: mm [inch]

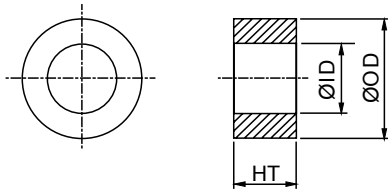
TAP-CN03



NOTE 1) More accessories for ASDA-A3 coming soon.
2) Accessories images shown here may differ from actual product appearance.

• Ferrite Rings

ASD-ACFC7K00

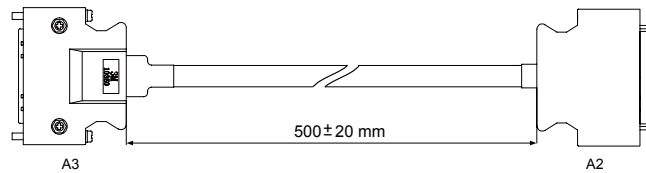


| Part No. | Outer Diameter | Inner Diameter | height |
|--------------|----------------|----------------|------------|
| ASD-ACFC7K00 | 68.0 ± 0.6 | 44.0 ± 0.6 | 13.5 ± 0.5 |

• A3 / A2 Adapter Cable

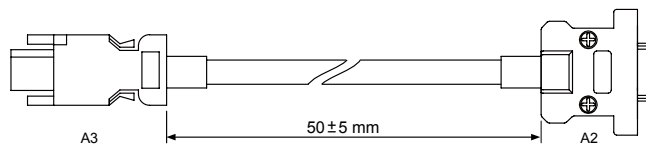
A3/A2 CN1 Adapter Cable

3081709800



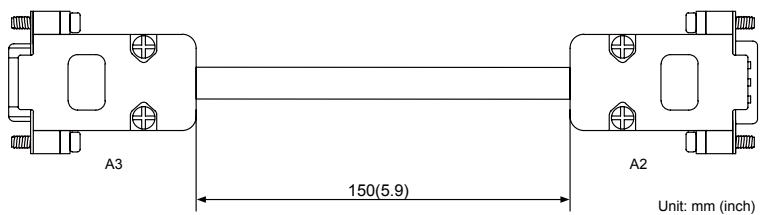
A3/A2 CN2 Adapter Cable

3081709600



A3/A2 CN5 Adapter Cable

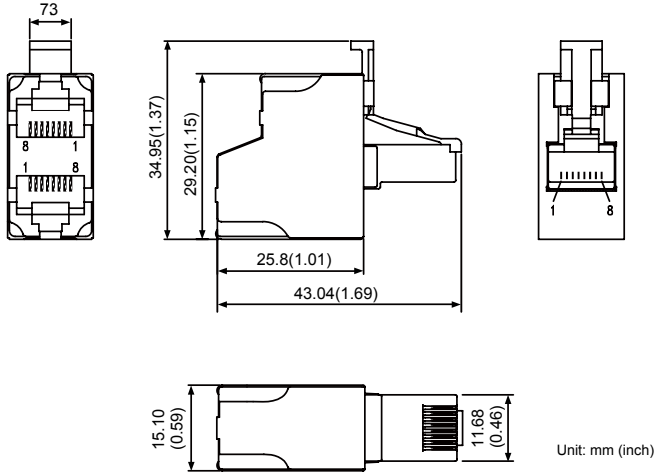
3081709700



Unit: mm (inch)

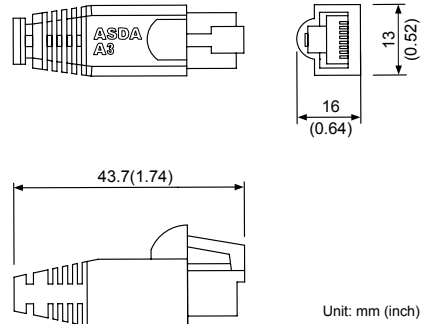
• **A3 CN3 RS-485 Tap**

ACS3-CNADC3RC



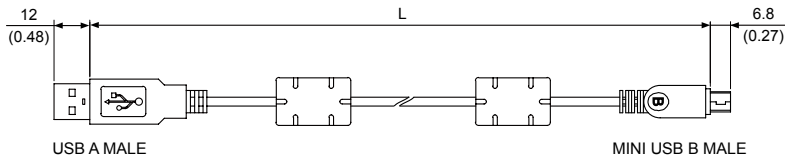
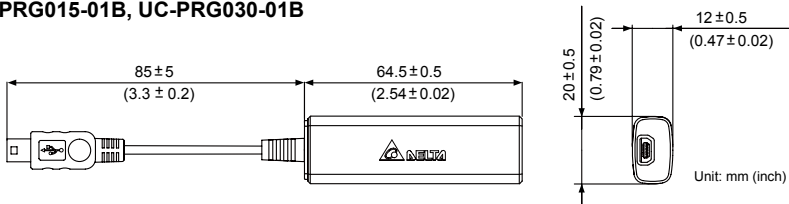
• **A3 CN3 RS-485 / CANOpen Termination Resistor**

ACS3-CNADC3TR



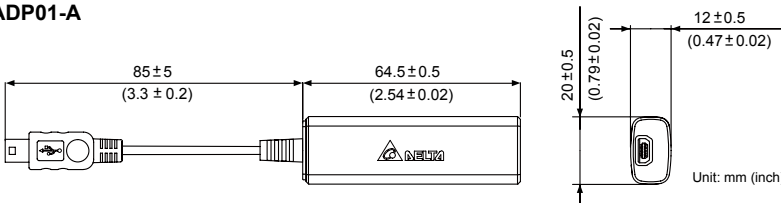
• **CN4 Mini USB Module**

UC-PRG015-01B, UC-PRG030-01B

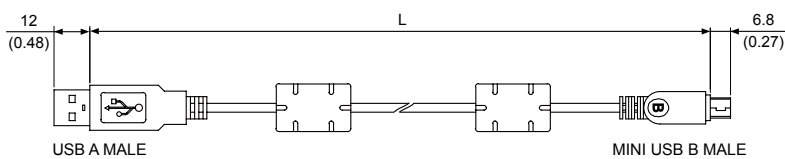


| Item | Part No. | L | |
|------|---------------|------------|---------|
| | | mm | inch |
| 1 | UC-PRG015-01B | 1500 ± 100 | 59 ± 4 |
| 2 | UC-PRG030-01B | 3000 ± 100 | 118 ± 4 |

UC-ADP01-A



UC-PRG015-01A, UC-PRG030-01A



| Item | Part No. | L | |
|------|---------------|------------|---------|
| | | mm | inch |
| 1 | UC-PRG015-01A | 1500 ± 100 | 59 ± 4 |
| 2 | UC-PRG030-01A | 3000 ± 100 | 118 ± 4 |

Servo Drive Accessories Combinations

100W Servo Drive and 50W Low / High Inertia Servo Motor

| Servo Ddrive | ASD-A3-0121-□ |
|---------------------------------|--|
| Servo Motor Model Name | ECM-A3L-C ① 040F ② S1 ECM-A3H-C ① 040F ② S1 ECM-A3L-C ① 0401 ② S1 ECM-A3H-C ① 0401 ② S1 |
| Power Cable (Without Brake) | ACS3-CAPW110X |
| Power Connector (Without Brake) | ASDBCAPW0000 |
| Power Cable (With Brake) | ACS3-CAPW210X |
| Power Connector (With Brake) | ASDBCAPW0100 |
| Incremental Encoder Cable | ACS3-CAEN100X |
| Absolute Encoder Cable | ACS3-CAEA100X |

(X=3 indicates that the cable length is 3m; X=5 indicates that the cable length is 5m)

750W Servo Drive and 750W Low / High Inertia Servo Motor

| Servo Ddrive | ASD-A3-0721-□ |
|---------------------------------|--|
| Low Inertia Servo Motor | ECM-A3L-C ① 0807 ② S1 ECM-A3H-C ① 0807 ② S1 |
| Power Cable (Without Brake) | ACS3-CAPW110X |
| Power Connector (Without Brake) | ASDBCAPW0000 |
| Power Cable (With Brake) | ACS3-CAPW210X |
| Power Connector (With Brake) | ASDBCAPW0100 |
| Incremental Encoder Cable | ACS3-CAEN100X |
| Absolute Encoder Cable | ACS3-CAEA100X |

(X=3 indicates that the cable length is 3m; X=5 indicates that the cable length is 5m)

200W Servo Drive and 200W Low / High Inertia Servo Motor

| Servo Ddrive | ASD-A3-0221-□ |
|---------------------------------|--|
| Servo Motor Model Name | ECM-A3L-C ① 0602 ② S1 ECM-A3H-C ① 0602 ② S1 |
| Power Cable (Without Brake) | ACS3-CAPW110X |
| Power Connector (Without Brake) | ASDBCAPW0000 |
| Power Cable (With Brake) | ACS3-CAPW210X |
| Power Connector (With Brake) | ASDBCAPW0100 |
| Incremental Encoder Cable | ACS3-CAEN100X |
| Absolute Encoder Cable | ACS3-CAEA100X |

(X=3 indicates that the cable length is 3m; X=5 indicates that the cable length is 5m)

1 kW1kW Servo Drive and 1kW Medium Inertia Servo Motor and 850W High Inertia Servo Motor

| Servo Ddrive | ASD-A3-1021-□ |
|-----------------------------|---|
| Medium Inertia Servo Motor | ECMC-CW1010 ② S ECMC-EW1310 ② S ECMC-FW1308 ② S |
| Power Cable (Without Brake) | ACS3-CAPW120X |
| Power Cable (With Brake) | ACS3-CAPW220X |
| Power Connector | ASD-CAPW1000 |
| Incremental Encoder Cable | ACS3-CAEN300X |
| Absolute Encoder Cable | ACS3-CAEA300X |

(X=3 indicates that the cable length is 3m; X=5 indicates that the cable length is 5m)

400W Servo Drive and 400W Low / High Inertia Servo Motor

| Servo Ddrive | ASD-A3-0421-□ |
|---------------------------------|--|
| Servo Motor Model Name | ECM-A3L-C ① 0604 ② S1 ECM-A3H-C ① 0604 ② S1 ECM-A3L-C ① 0804 ② S1 ECM-A3H-C ① 0804 ② S1 |
| Power Cable (Without Brake) | ACS3-CAPW110X |
| Power Connector (Without Brake) | ASDBCAPW0000 |
| Power Cable (With Brake) | ACS3-CAPW210X |
| Power Connector (With Brake) | ASDBCAPW0100 |
| Incremental Encoder Cable | ACS3-CAEN100X |
| Absolute Encoder Cable | ACS3-CAEA100X |

(X=3 indicates that the cable length is 3m; X=5 indicates that the cable length is 5m)

1.5kW Servo Drive and 1.5kW Medium Inertia Servo Motor

| Servo Ddrive | ASD-A3-1521-□ |
|-----------------------------|-----------------|
| High Inertia Servo Motor | ECMC-EW1315 ② S |
| Power Cable (Without Brake) | ACS3-CAPW120X |
| Power Cable (With Brake) | ACS3-CAPW220X |
| Power Connector | ASD-CAPW1000 |
| Incremental Encoder Cable | ACS3-CAEN300X |
| Absolute Encoder Cable | ACS3-CAEA300X |

(X=3 indicates that the cable length is 3m; X=5 indicates that the cable length is 5m)

2kW Servo Drive and 2kW Medium Inertia Servo Motor and 1.3kW, 1.8kW High Inertia Servo Motor

| | |
|-----------------------------|---|
| Servo Drive | ASD-A3-2023 □ |
| Low Inertia Servo Motor | ECMC-EW1320 [2] S ECMC-FW1313 [2] S ECMC-FW1318 [2] S |
| Power Cable (Without Brake) | ACS3-CAPW130X |
| Power Cable (With Brake) | ACS3-CAPW230X |
| Power Connector | ASD-CAPW1000 |
| Incremental Encoder Cable | ACS3-CAEN300X |
| Absolute Encoder Cable | ACS3-CAEA300X |

(X=3 indicates that the cable length is 3m; X=5 indicates that the cable length is 5m)

2kW Servo Drive and 2kW Medium Inertia Servo Motor

| | |
|-----------------------------|-------------------|
| Servo Drive | ASD-A3-2023-□ |
| High Inertia Servo Motor | ECMC-EW1820 [2] S |
| Power Cable (Without Brake) | ACS3-CAPW140X |
| Power Cable (With Brake) | ACS3-CAPW240X |
| Power Connector | ASD-CAPW2000 |
| Incremental Encoder Cable | ACS3-CAEN300X |
| Absolute Encoder Cable | ACS3-CAEA300X |

(X=3 indicates that the cable length is 3m; X=5 indicates that the cable length is 5m)

3kW Servo Drive and 3kW Medium Inertia Servo Motor

| | |
|-----------------------------|--|
| Servo Drive | ASD-A3-3023-□ |
| High Inertia Servo Motor | ECMC-EW1830 [2] S ECMC-FW1830 [2] S |
| Power Cable (Without Brake) | ACS3-CAPW140X |
| Power Cable (With Brake) | ACS3-CAPW240X |
| Power Connector | ASD-CAPW2000 |
| Incremental Encoder Cable | ACS3-CAEN300X |
| Absolute Encoder Cable | ACS3-CAEA300X |

(X=3 indicates that the cable length is 3m; X=5 indicates that the cable length is 5m)

Note: In servo motor model names, [1] signifies encoder type, [2] signifies brake or keyway/oil seal.





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Industrial Automation Headquarters

Delta Electronics, Inc.

Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan District,
Taoyuan City 33068, Taiwan
TEL: 886-3-362-6301 / FAX: 886-3-371-6301

Asia

Delta Electronics (Shanghai) Co., Ltd.

No.182 Minyu Rd., Pudong Shanghai, P.R.C.
Post code : 201209
TEL: 86-21-6872-3988 / FAX: 86-21-6872-3996
Customer Service: 400-820-9595

Delta Electronics (Japan), Inc.

Tokyo Office
Industrial Automation Sales Department
2-1-14 Shibadaimon, Minato-ku
Tokyo, Japan 105-0012
TEL: 81-3-5733-1155 / FAX: 81-3-5733-1255

Delta Electronics (Korea), Inc.

Seoul Office
1511, 219, Gasan Digital 1-Ro., Geumcheon-gu,
Seoul, 08501 South Korea
TEL: 82-2-515-5305 / FAX: 82-2-515-5302

Delta Energy Systems (Singapore) Pte Ltd.

4 Kaki Bukit Avenue 1, #05-04, Singapore 417939
TEL: 65-6747-5155 / FAX: 65-6744-9228

Delta Electronics (India) Pvt. Ltd.

Plot No.43, Sector 35, HSIIDC Gurgaon,
PIN 122001, Haryana, India
TEL: 91-124-4874900 / FAX : 91-124-4874945

Delta Electronics (Thailand) PCL.

909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z),
Pattana 1 Rd., T.Phraksa, A.Muang,
Samutprakarn 10280, Thailand
TEL: 66-2709-2800 / FAX : 662-709-2827

Delta Energy Systems (Australia) Pty Ltd.

Unit 20-21/45 Normanby Rd., Notting Hill Vic 3168, Australia
TEL: 61-3-9543-3720

Americas

Delta Electronics (Americas) Ltd.

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

São Paulo Office
Rua Itapeva, 26 – 3º Andar - Bela Vista
CEP: 01332-000 – São Paulo – SP - Brasil
TEL: 55-11-3530-8642 / 55-11-3530-8640

Delta Electronics International Mexico S.A. de C.V.

Mexico Office
Vía Dr. Gustavo Baz No. 2160, Colonia La Loma,
54060 Tlalnepantla Estado de Mexico
TEL: 52-55-2628-3015 #3050/3052

EMEA

Delta Electronics (Netherlands) BV

Eindhoven Office
De Witbogt 20, 5652 AG Eindhoven, The Netherlands
MAIL: Sales.IA.EMEA@deltaww.com
MAIL: Sales.IA.Benelux@deltaww.com

Delta Electronics (France) S.A.

ZI du bois Chaland 2 15 rue des Pyrénées,
Lisses 91056 Evry Cedex, France
MAIL: Sales.IA.FR@deltaww.com

Delta Electronics Solutions (Spain) S.L.U

Ctra. De Villaverde a Vallecas, 265 1ª Dcha Ed.
Hormigueras – P.I. de Vallecas 28031 Madrid
C/Llull, 321-329 (Edificio CINC) | 22@Barcelona, 08019 Barcelona
MAIL: Sales.IA.Iberia@deltaww.com

Delta Electronics (Italy) Srl

Ufficio di Milano Via Senigallia 18/2 20161 Milano (MI)
Piazza Grazioli 18 00186 Roma, Italy
MAIL: Sales.IA.Italy@deltaww.com

Delta Electronics (Germany) GmbH

Coesterweg 45, D-59494 Soest, Germany
MAIL: Sales.IA.DACH@deltaww.com

Delta Energy Systems LLC (CIS)

Vereyskaya Plaza II, office 112 Vereyskaya str.
17 121357 Moscow, Russia
MAIL: Sales.IA.RU@deltaww.com

Delta Greentech Ltd. (Turkiye)

Serifali Mevkii Barboros Bulvari Soylesi Sok
No 19 34775, Y.Dudullu-Umraniye/Istanbul
MAIL: Sales.IA.Turkey@delta-emea.com

Delta Energy Systems AG (Dubai BR)

P.O. Box 185668, Gate 7, 3rd Floor, Hamarain Centre,
Dubai, United Arab Emirates
MAIL: Sales.IA.MEA@deltaww.com