FAQ – AC Servo Systems

Delta Electronics (Netherlands) B.V.

De Witbogt 20, 5652AG, Eindhoven, the Netherlands

Technical Support contact: iatechnicalsupport@deltaww.com

www.delta-emea.com

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ASDA series AC Servo Drives

Q   **What does the alarm AL017 mean and how can it be prevented?**

A   The alarm AL017 happens when the EEPROM cannot be written, this happens when the maximum number of write operations is exceeded.

Most customers use the communication control mode with our drive for positioning and speed control. In that case the parameters are written in the EEPROM at each communication write operation. But after several years of operation, the drive almost certainly reaches the EEPROM write life time and will show AL017 if the user doesnt set P2-30=5.

After power off/on, this parameter, however, is set back to P2-30=0. Therefore it is recommended, if communication is used to control the drive, to always set P2-30=5 after power on.

Q   **How can AL011 error be reset?**

A   The AL011 error means that the encoder signal is not correct. It occurs e.g. when the motor is disconnected. It can only be reset by power off and on.

Please refer to the user manual for more info about how to reset faults.

Q   **Why is the ratio of <u>load inertia</u> and <u>motor inertia</u> as adjusted by the user not equal to the measured value?**

A   Ensure that the following conditions are met when estimating the ratio of load and motor inertia:

- The acc and dec times to reach 2000rpm must be ≤1s.
- The speed must be ≥200rpm.
- The load inertia **cannot** be more than 100x motor inertia.
- External forces should be kept to a minimum and the load inertia shouldn't change too much during measurement.
- In Auto Mode (P2-32=3 or 5) the servo drive will stop measuring the load inertia value.

Q   **What is the meaning of the symbols with which the parameters are marked in the manual?**

A   (★)   Read only
(▲)   Parameter cannot be set when Servo On
(●)   Parameter change only effective when ASDA-A is powered off and on again

(■)   Parameter value not saved at power off.

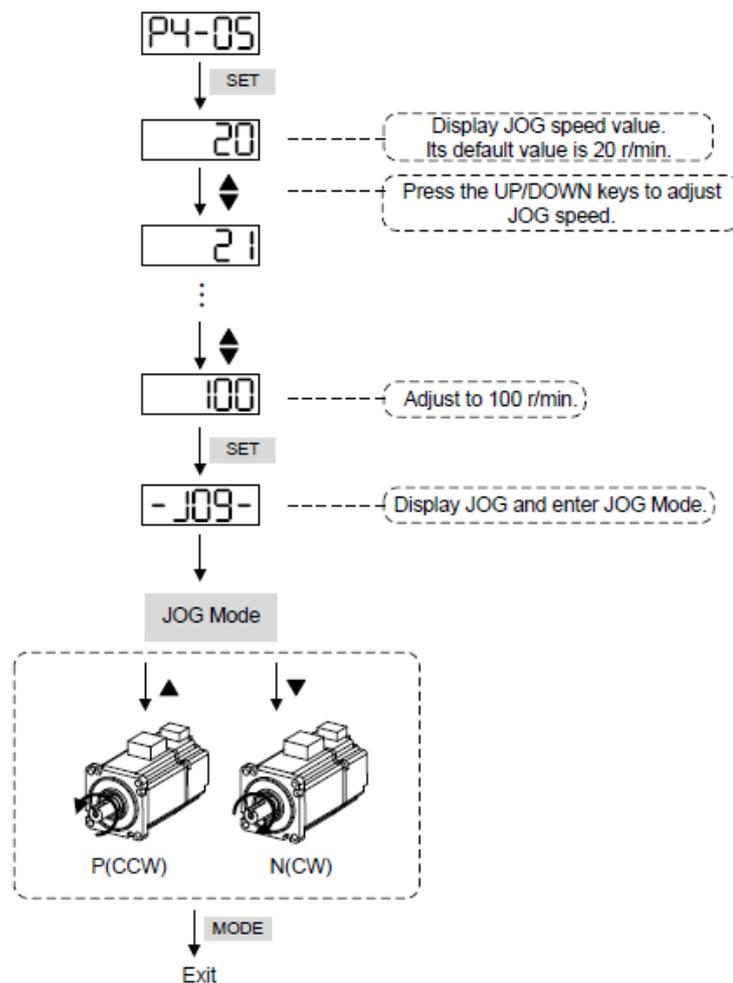**Q**   **How to use the keypad to perform JOG function?**

A   Step 1: Enter P4-05

Step 2: Press [SET] key. Jog speed is displayed. Default value 20rpm.

Step 3: Press [∧] UP or [∨] DOWN key to change the JOG speed. Example value 100rpm,

Step 4: Press [SET] key. Display shows "JOG".

Step 5: Press [∧] UP or [∨] DOWN key to jog the motor CCW or CW. The motor only rotates as long as one of these keys is pressed

Q   **When to use regenerative resistor (brake resistor) and how to connect it?**

A   When the shaft torque is in the opposite direction of the shaft speed, regenerative power is fed back to the drive, resulting in a fast increase of the DC-bus voltage, which can become too high and cause damage to the drive. The regenerative energy can

be dissipated in the brake resistor.

The servo drive with lower power ratings (refer to the user manual) has a built-in brake resistor and if the capacity is too small, an external brake resistor can be connected.

Built-in brake resistor: Connect output [P] to [D] and leave [P]-[C] open.

External brake resistor: Connect between [P]-[C] and leave [P]-[D] open.

More info can be found in the user manual about brake resistors with calculation examples and set P1-52/P1-53 accordingly when using an external brake resistor.

When the fault message "AL005" appears, the regenerative power is too high and an external brake resistor should be considered.

Q   How to enable the torque limit function in Speed Mode?

A   There are two methods for enabling the torque limit function.
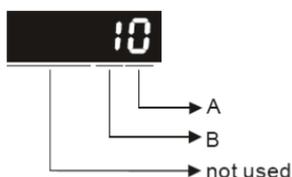
One is using parameter P1-02:

B=0: Disable torque limit function

B=1: Enable torque limit function

(It is available in position and speed mode)

The other one is using a digital input:

The user can use digital input TRQLM (DI code is 09). When it is activated to be ON in Position and Speed Mode, the motor torque limit function is enabled.

Q   When the torque limit function is enabled, what is the torque limit command?

A   The torque limit command is either internal parameter or analog voltage command. The source of the torque limit is determined by the torque command TCM0 and TCM1 of DI signal.
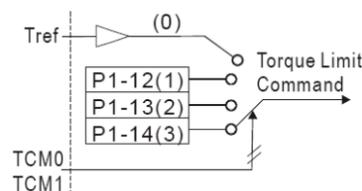
Command No.	DI signal of CN1		Command Source		Content	Range
	TCM1	TCM0				
T1	OFF	OFF	Mode	T Analog command	Voltage between V-REF and GND	+/-10 V
				Tz None	Torque command is 0	0
T2	OFF	ON	Internal parameter		P1-12	0 ~ 300 %
T3	ON	OFF			P1-13	0 ~ 300 %
T4	ON	ON			P1-14	0 ~ 300 %

Q   **How to set the encoder output pulse number on OA, /OA, OB, /OB and OZ, /OZ?**

A   The encoder output pulse number can be set in parameter P1-46.
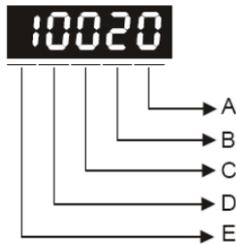
Set a divider

E=0

DCBA=divider (range 1~125)

The divider divides the motor encoder pulse number of 2500ppr.

Example: If you want 500ppr on the output, the divider must be 2500/500=5.
            Please set P1-46=**0**0005
            If you want 1250ppr on the output, the divider must be 2500/1250=2.
            Please set P1-46=**0**0002

Note: The divider can only be an integer so the output pulse number cannot be set to all values.

Set a pulse number

E=1

DCBA=pulse number (range 20~2500)

Example: If you want 1024ppr on the output, set P1-46=**1**1024
            If you want 512ppr on the output, set P1-46=**1**0512

Q   **How to set the responsiveness (=bandwidth) of the Speed and Position loops?**

A   P2-00 KPP   The Position Loop Responsiveness in Hz is $\dfrac{KPP}{2\pi}$

        P2-04 KVP   The Speed Loop Responsiveness in Hz is $\dfrac{KVP}{2\pi(1+J_L/J_M)}$
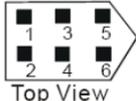
To get stable operation, estimate J_L/J_M and set in P1-37 or measure in Auto Mode PI (P2-32=2) or Auto Mode PDFF (P2-32=4) and read value in P1-37 and subsequently calculate KPP and KVP so that Speed Loop responsiveness is 4~6 times Position Loop responsiveness.

For more info, please refer also to the manual.

Q   **For connecting two servo drives to an HMI with RS485 protocol, do I need to use two RS-422/RS-485 converters?**

A   No converters are needed. Connect the HMI to both servo drives as indicated below:

_RS-485_

DOP Series 9 pin D-SUB male (RS-485)	Controller CN3 cable connector (RS-485)	Controller CN3 cable connector (RS-485)
RXD+ (2) ─┐ TXD+ (3) ─┘ ┌─(3) 485+ 　　　　　└─(5) 485+ RXD- (1) ─┐ TXD- (4) ─┘ ┌─(4) 485- 　　　　　└─(6) 485-		1　3　5 2　4　6 Top View

Both Modbus ports of the servo drives can be connected in parallel. Please assign a different slave address to each servo drive (P3-00) and set the correct communication (P3-05=2).

Q   **Which item should I order if I need the battery for the servo motor with an absolute encoder?**

A   The PN of the battery is ASD-CLBT0100 and the specification is listed in Chapter 12.1.1 in the ASDA-A2 series user manual. However, it is not possible to connect it to the encoder cable directly. Therefore, we suggest to order the battery box below with either 1pc battery or 2pcs batteries included, so it is more convenient for the connection.

Battery box with 1pc battery: ASD-MDBT0100
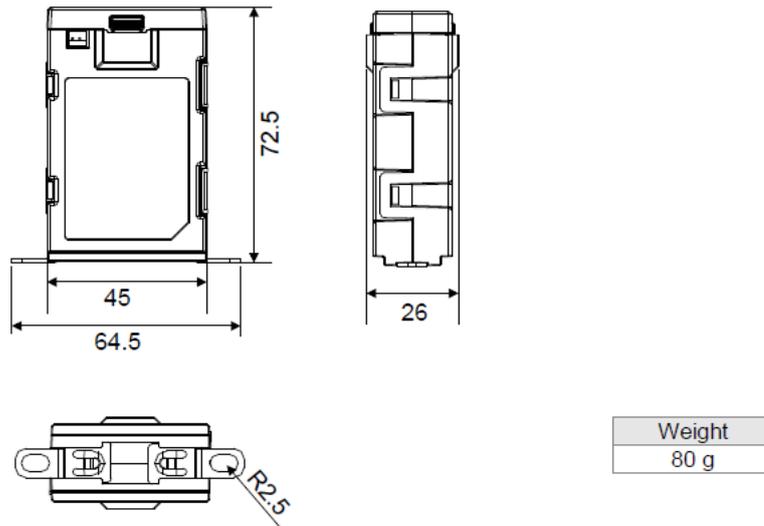Battery box with 2pcs batteries: ASD-MDBT0200

ASD-MDBT0100
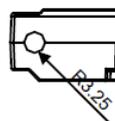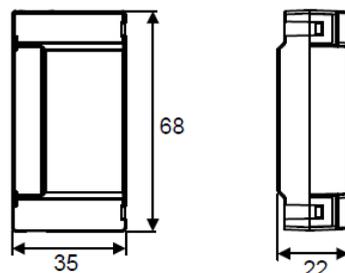
Weight
44 g

Units: mm

ASD-MDBT0200

Weight
80 g

Units: mm

ECMA Series AC Servo Motors

Q   **Where can I find CAD drawings of the ECMA motor series?**

A   On our ftp-site you can find for ECMA series servo motor a folder with 2D CAD drawings, both in .dwg and .pdf format. For easy downloading there's also one .zip file per ECMA series (separate for 220V and 400V, with brake and without brake).

Q   **ECMA servo motors are marked with "110V" on the label. Are they suitable for 230V operation?**

A   Acc. to UL requirements, the values on the label should either be all rated values (rated voltage, rated speed, rated current, etc) or maximum values (max voltage, max speed, max current, etc). Delta has chosen to put the rated values on the label. The rated voltage of the ECMA motors is 110V at rated speed 3000rpm. The maximum voltage is 220V at max speed 5000rpm. But you don't need to worry; the motor is perfectly matched to the servo drive.