

# Power Cable for A2 & B2 servo systems 100/200/400/750 Watt

24-8-2021 Kevin Damen & Micky Vork

Power Cable Wiring looms for DamenCNC RTR Servo controllers, using Delta ASDA-A2 and/or ASDA-B2 drivers (100,200,400,750W) and/or Delta ASD-M-0721-M. Starting from the servo driver. The UVW power cable has to be connected chassis cable, our part number 4970/5121. From there we are in the middle column, these are just standard plug and play M12-S (3+PE) Male/Female cables. You could also DIY these using a MALE and FEMALE M12-S connector. The pining is 1 to 1. Next step is to attach the M12-S (3+PE) Male connector to the servomotor.

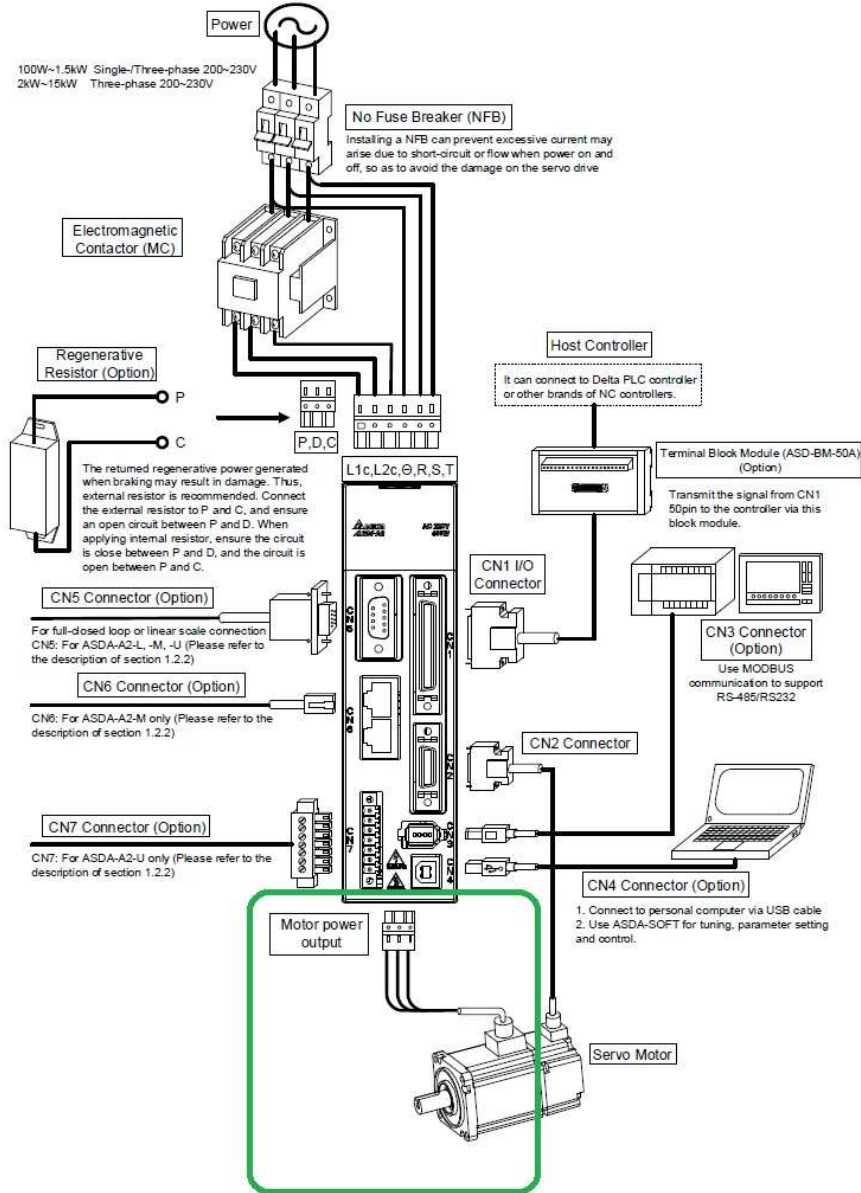
|  |                     |  |                     |   |                     |
|--|---------------------|--|---------------------|---|---------------------|
|                          |                     |    |                     |    |                     |
| (4970,5121)  |                     | (5480,5481,5482,5483)  |                     | (4965)  |                     |
|                         |                     |    |                     |  |                     |
| <b>Delta ASDA A2/B2 Driver Motor Connection (U/V/W + Earth)</b><br><b>Pin number, color &amp; function</b> |                     | <b>M12-S (3+PE) Male / Female Cable. Pin number and color</b>  |                     | <b>Cable colors on Servomotor</b><br><b>Pin number, color &amp; function</b>          |                     |
| U  |                     | 1  | Black 1             | 1   | Red                 |
| V  |                     | 2  | Black 2             | 2   | White               |
| W  |                     | 3  | Black 3             | 3   | Black               |
|  |                     | 4  | Green/Yellow        | 4   | Green/Yellow        |
|  | Shield (to housing) |  | Shield (to housing) |   | Shield (to housing) |
| NOTE: Always use a MALE connector on the motor side (4965)   |                     |  |                     |   |                     |
| Suggested standard cables 5480,5481,5482,5483  |                     |  |                     |   |                     |
| Use proper EMC shielding on the driver side. For example our 5206  |                     |  <p>Example of the part 5206 mounted on a Delta B2 servo drive</p> |                     |   |                     |

**Reference Material from Delta A2 manual page 48 (12-8 Revision July 2015)**

**WARNING: Always look at the physical connector included with the A2 driver. It has a sticker on it, that is labeled UVW.**

**3.1 Connections - 220V series**

**3.1.1 Connecting to Peripheral Devices**



**Reference Material from Delta A2 manual page 49 (12-8 Revision July 2015)**

**Here you can verify that color coding for the servomotor is correct (third column)**

**WARNING: Always look at the physical connector included with the A2 driver. It has a sticker on it, that is labeled UVW.**



Installation notes:

1. Check if the power and wiring among R, S, T and L1c, L2c are correct.  
Please refer to Chapter 11 for Specifications. Make sure the input voltage is correct, or it might damage the servo drive or danger may occur.
2. Please check if the output terminal U, V, W of the servo motor is correctly wired. The incorrect wiring may disable the operation of the motor or cause malfunction.
3. When applying to the external regenerative resistor, the contact between P ⊕ and D should be opened and the external regenerative resistor should connect to terminal P ⊕ and C. When applying to the internal regenerative resistor, the contact between P ⊕ and D should be closed and the contact between P ⊕ and C should be opened.
4. When an alarm occurs or the system is in emergency stop status, use ALARM or WARN to output and disconnect the power of magnetic contactor in order to disconnect the power of servo drive.

**3.1.2 Connectors and Terminals of Servo Drive**

| Terminal Signal | Name                               | Description   |            |  |
|-----------------|------------------------------------|---|------------|--|
| L1c, L2c        | Power input of the control circuit | Connect to single-phase AC power (select the appropriate voltage specification according to the product ) |            |  |
| R, S, T         | Power input of the main circuit    | Connect to three-phase AC power (select the appropriate voltage specification according to the product)   |            |  |
| U, V, W<br>FG   | Motor cable                        | Connect to the servo motor  |            |  |
|                 |                                    | Terminal Symbol   | Wire Color | Description                                |
|                 |                                    | U   | Red        | Three-phase main power cable of the motor. |
|                 |                                    | V   | White      |  |
|                 |                                    | W   | Black      |  |
| FG              | Green                              | Connect to ground terminal (⊕) of the servo drive.  |            |  |

Reference Material from Delta B2 manual page 40 (Revision May 2018)

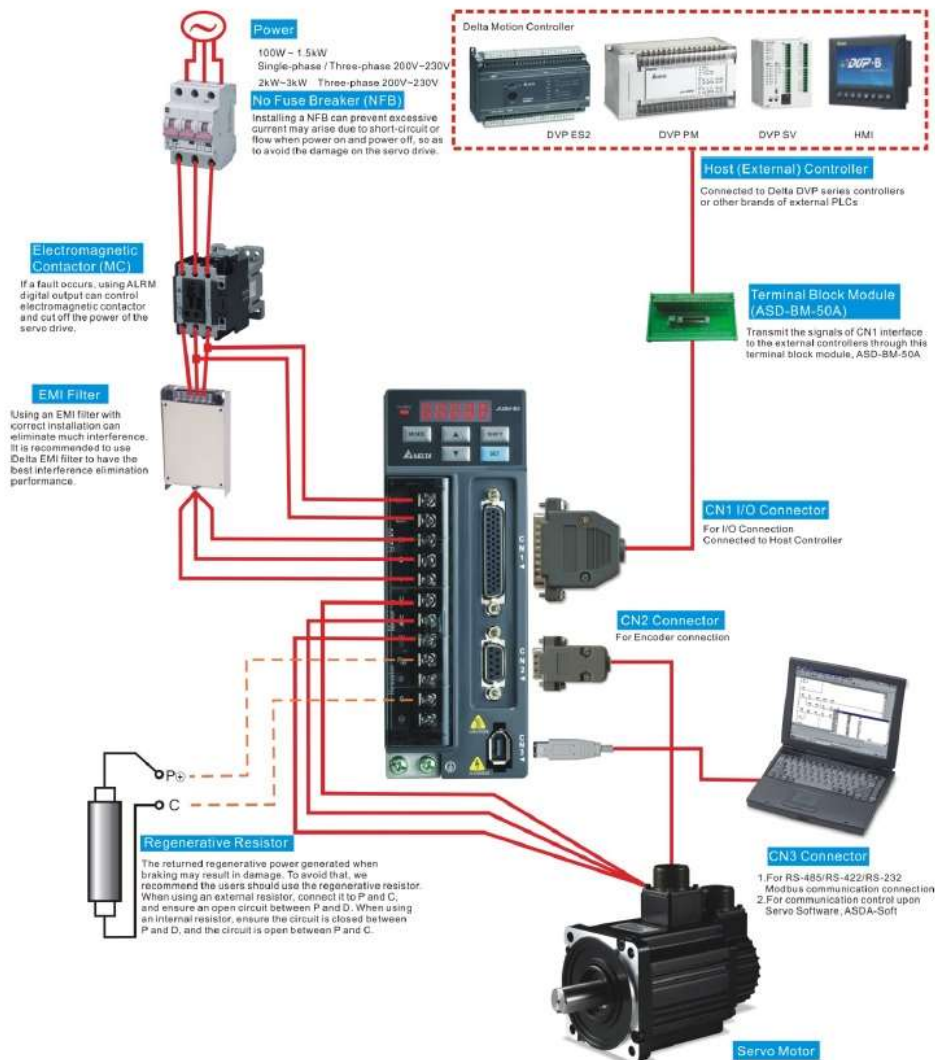
**WARNING:** Always look at the physical connections on the B2 driver. The driver has a sticker on it, that is labeled UVW, and is also color coded.

## Chapter 3 Wiring

This chapter provides information on wiring ASDA-B2 series products, the descriptions of I/O signals and gives typical examples of wiring diagrams.

### 3.1 Connections

#### 3.1.1 Connecting to Peripheral Devices



Revision May, 2018

3-1

**Reference Material from Delta B2 manual page 41 (Revision May 2018)**

**Here you can verify that color coding for the servomotor is correct (third column)**

**WARNING: Always look at the physical connections on the driver. The driver has a sticker on it, that is labeled UVW, and is also color coded.**



**Installation notes:**

1. Check if the power and wiring among R, S, T and L1c, L2c are correct.
2. Please check if the output terminal U, V, W of the servo motor is correctly wired. The incorrect wiring may disable the operation of the motor or cause malfunction.
3. When applying to the external regenerative resistor, the contact between P<sup>+</sup> and D should be opened and the external regenerative resistor should connect to terminal P<sup>+</sup> and C. When applying to the internal regenerative resistor, the contact between P<sup>+</sup> and D should be closed and the contact between P<sup>+</sup> and C should be opened.
4. When an alarm occurs or the system is in emergency stop status, use ALARM or WARN to output and disconnect the power of magnetic contactor in order to disconnect the power of servo drive.

**3.1.2 Servo Drive Connectors and Terminals**

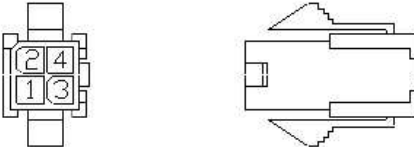
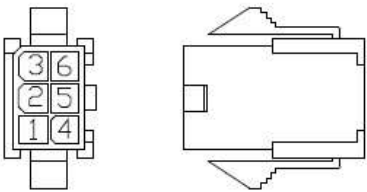
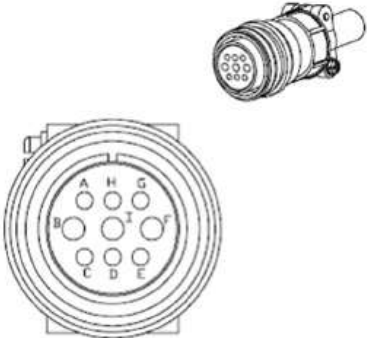
| Terminal Signal          | Name   | Description   |  |   |
|--------------------------|--|---|--|---|
| L1c, L2c                 | Control circuit terminal                       | Used to connect single-phase AC control circuit power. (Control circuit uses the same voltage as the main circuit.) |  |   |
| R, S, T                  | Main circuit terminal                          | Used to connect three-phase AC main circuit power depending on connecting servo drive model.                        |  |   |
| U, V, W,<br>FG (⊖)       | Servo motor output                             | Used to connect servo motor   |  |   |
|                          |  | Terminal Symbol   | Wire Color   | Description   |
|                          |  | U   | Red  | Connecting to three-phase motor main circuit cable. |
|                          |  | V   | White  |   |
| W                        | Black  | Connecting to ground terminal (⊖) of the servo drive.   |  |   |
| FG (⊖)                   | Green  |   |  |   |
| P <sup>+</sup> , D, C, ⊖ | Regenerative resistor terminal or braking unit | Internal resistor   | Ensure the circuit is closed between P <sup>+</sup> and D, and the circuit is open between P <sup>+</sup> and C.   |   |
|                          |  | External resistor   | Connect regenerative resistor to P <sup>+</sup> and C, and ensure an open circuit between P <sup>+</sup> and D.  |   |
|                          |  | External braking unit   | Connect braking unit to P <sup>+</sup> and ⊖, and ensure an open circuit between P <sup>+</sup> and D, and P <sup>+</sup> and C.<br>(N terminal is built in L1c, L2c, ⊖, and R, S, T.)<br>P <sup>+</sup> : Connecting to (+) terminal of V_BUS voltage.<br>⊖: Connecting to (-) terminal of V_BUS voltage. |   |

Reference Material from Delta B2 manual page 45 (Revision May 2018)

Here you can verify that color coding for the servomotor is correct (third column)

**WARNING:** Always look at the physical connections on the driver. The driver has a sticker on it, that is labeled UVW, and is also color coded.


### 3.1.4 Specification of Motor Power Cable

| Motor Model  | U, V, W / Connector of Brake  | Terminal Identification |
|--|---|-------------------------|
| ECMA-C△0401□S (100W)<br>ECMA-C△0602□S (200W)<br>ECMA-C△0604□S (400W)<br>ECMA-C△0604□H (400W)<br>ECMA-CM0604PS (400W)<br>ECMA-C△0804□7 (400W)<br>ECMA-C△0807□S (750W)<br>ECMA-C△0807□H (750W)<br>ECMA-CM0807PS (750W)<br>ECMA-C△0907□S (750W)<br>ECMA-C△0910□S (1000W)  |  <p>HOUSING: JOWLE (C4201H00-2*2PA)</p>   | A                       |
| ECMA-C△0602□S (200W)<br>ECMA-C△0604□S (400W)<br>ECMA-CM0604PS (400W)<br>ECMA-C△0804□7 (400W)<br>ECMA-C△0807□S (750W)<br>ECMA-C△0907□S (750W)<br>ECMA-C△0910□S (1000W)  |  <p>HOUSING: JOWLE (C4201H00-2*3PA)</p> | B                       |
| ECMA-G△1303□S (300W)<br>ECMA-E△1305□S (500W)<br>ECMA-G△1306□S (600W)<br>ECMA-F△1308□S (850W)<br>ECMA-G△1309□S (900W)<br>ECMA-C△1010□S (1000W)<br>ECMA-E△1310□S (1000W)<br>ECMA-F△1313□S (1300W)<br>ECMA-E△1315□S (1500W)<br>ECMA-F△1318□S (1800W)<br>ECMA-C△1020□S (2000W)<br>ECMA-E△1320□S (2000W)<br>ECMA-C△1330□4 (3000W) |  <p>3106A-20-18S</p>                    | C                       |

Reference Material from Delta B2 manual page 46 (Revision May 2018)

Here you can verify that color coding for the servomotor is correct (third column)

**WARNING:** Always look at the physical connections on the driver. The driver has a sticker on it, that is labeled UVW, and is also color coded.

| Motor Model  | U, V, W / Connector of Brake   | Terminal Identification |
|--|--|-------------------------|
| ECMA-E△1820□S (2000W)<br>ECMA-E△1830□S (3000W)<br>ECMA-F△1830□S (3000W)<br>ECMA-E△1835□S (3500W) |  <p>3106A-24-11S</p> | D                       |

| Terminal Identification | U (Red) | V (White) | W (Black) | CASE GROUND (Yellow green) | BRAKE1 (Brown) | BRAKE2 (Blue) |
|-------------------------|---------|-----------|-----------|----------------------------|----------------|---------------|
| A                       | 1       | 2         | 3         | 4                          | -              | -             |
| B                       | 1       | 2         | 4         | 5                          | 3              | 6             |
| C                       | F       | I         | B         | E                          | G              | H             |
| D                       | D       | E         | F         | G                          | A              | B             |

When selecting the wire rod, please choose 600V PVC cable and the length should not longer than 30m. If the length exceeds 30m, please take the received voltage into consideration when selecting the wire size. Please refer to Section 3.1.6 for wire rod selection.



**NOTE**

1. The coil of brake has no polarity. The names of terminal identification are BRAKE1 and BRAKE2.
2. The power supply for brake is DC24V. Never use it for VDD, the +24V source voltage.
3. (□) in servo motor model represents brake or keyway / oil seal.
4. (△) in servo motor model represents encoder type.  
 △ = 1: incremental, 20-bit; △ = 2: incremental, 17-bit;  
 △ = M: magnetic.