



1394 Digital AC Multi-Axis Motion Control System

(Catalog Numbers 1394x-SJTxx-A, -C, -C-RL, -L, -L-RL, -T, -T-RL)

The following information reflects changes that have been made to the 1394 Motion Control System. Use this document in conjunction with the *1394 Digital AC Multi-Axis Motion Control System User Manual* (publication 1394-5.0-MAY00).

Page 2-9

Replace the note on page 2-9 (near the bottom of step 3) with the note below. The word *should* has been changed to *must*.

Note: If both DCLM and DIM are mounted on the same system, the DIM must be the last module.

Page 3-15

Replace the table on page 3-15 with the table below. The ground connection terminology is corrected.

| Wire | Description | Maximum wire size | Connects to terminal(s) | Required (Y/N) |
|-------------------------|---|----------------------------|-------------------------------------|----------------|
| 24V Logic | A user-supplied 24V AC rms or 24V DC power source. Refer to <i>Appendix A</i> for 24V input power specifications. | 4 mm ² (12 AWG) | J1-1 (W1) J1-2 (W2) | Y |
| 360/480V AC Input Power | 360/480V AC, three-phase power input. Refer to <i>Appendix A</i> for system specifications for rated AC input voltage, tolerance, and source impedance. | 6 mm ² (10 AWG) | J10-1 (U) J10-2 (V) J10-3 (W) | Y |
| Ground | The 1394's ground connection to the bonded system ground bar on the subpanel. | 6 mm ² (10 AWG) | J10-4 (Ground) | N |
| Ground | The 1394's ground connection to the bonded system ground bar on the subpanel. | 10 mm ² (8 AWG) | System module single point bond bar | Y |
| External Shunt Resistor | Optional 1400W external shunt resistor used to dissipate excess regenerative energy from the system module. | 6 mm ² (10 AWG) | J11-1 (COL) J11-3 (DC+) | N |

Page 3-19

Add the Attention table below to the section *Connecting Power Wiring for 5 and 10 kW System Modules (Series C)* on page 3-19. The keys used in the power connectors are designed to prevent an improper power connection.

ATTENTION



To avoid personal injury or damage to equipment, verify that keys are inserted into the beveled slots above terminals V and W of the input power connector plug and PE and COL on the system module input and shunt power connectors, respectively. If the keys are missing, refer to *Installing Your 1394C Power Connector Key Kit Installation Instructions* (publication 1394-IN023x-EN-P).

Replace the table on page 3-19 with the table below. The columns for wire size range have been added.

| Terminal | Description | Terminal Block Wire Size Range | |
|----------|----------------|---|---|
| | | 1394x-AM03/04/07 mm ² (AWG) | 1394x-AM50/75 or -AM50/75-IH mm ² (AWG) |
| U1 | Motor Power A | 0.5 - 6 (22 - 10) | 0.5 - 10 (22 - 8) |
| V1 | Motor Power B | | |
| W1 | Motor Power C | | |
| PE1 | Axis Ground | | |
| PE2 | Motor Ground | | |
| PE3 | Overall Shield | | |

Page 3-20

Replace the Important paragraph on page 3-20 with the paragraph shown below. The paragraph now indicates that the noise filters are included on Series C axis modules.

IMPORTANT

Series C axis modules have noise filters on the motor thermal sensor and brake connectors (TB1 and TB2). The filters add capacitance (1.0 μ F) from each leg of the thermal switch and motor brake leads to ground. This should be considered when selecting ground fault circuits.

Page 4-6

Replace the table on page 4-6 with the table below. The registration input current information that applies to Series A and B system modules was added.

| Wire | Description | Terminal connections for 1394x-SJTxx-C, -C-RL and -T, -T-RL systems | Terminal connections for 1394C-SJTxx-L and -L-RL systems | Mandatory or Optional |
|------------------|--|--|--|-----------------------|
| REG 5V, 24V, COM | <p>High-speed, optically-isolated filtered registration input for each axis. Inputs can be either 5 or 24V DC. Refer to Figure 4.5 for typical registration device inputs.</p> <p>Note: To further reduce electrical noise, a dedicated power supply may be required for the registration sensors.</p> <p>You can disable the registration input filters by removing jumpers P0-P3 on the input wiring board.</p> <p>The registration input current is 2.5 mA when the input is activated. This current should be sufficient for most 5V devices, however, it might not be enough for typical 24V devices. To enhance the performance of these devices on Series A and B systems, you can raise the On current by placing a 470 ohm, 2 watt resistor across the common and input terminals of the 24V registration input. The resistor increases the current drawn from the sensor to over 50 mA. If your sensor can withstand more current, you can use a lower resistance. You do need to consider the power dissipation of the resistor.</p> | <p>For 5V TB1 16 (axis 0) TB2 16 (axis 1) TB1 20 (axis 2) TB2 20 (axis 3)</p> <p>For 24V TB1 17 - 18 (axis 0) TB2 17 - 18 (axis 1) TB1 21 - 22 (axis 2) TB2 21 - 22 (axis 3)</p> <p>For COM (used with 5V and 24V) TB1-18 (axis 0) TB2-18 (axis 1) TB1-22 (axis 2) TB2-22 (axis 3)</p> | <p>For 5V TB1 16 (axis 0) TB2 16 (axis 1)</p> <p>For 24V TB1 17 - 18 (axis 0) TB2 17 - 18 (axis 1)</p> <p>For COM (used with 5V and 24V) TB1-18 (axis 0) TB2-18 (axis 1)</p> | Optional |

Page 4-22

Add this note to the *Configuration Examples* section on page 4-22.

Note: If both DCLM and DIM are mounted on the same system, the DIM must be the last module.

Page 8-16

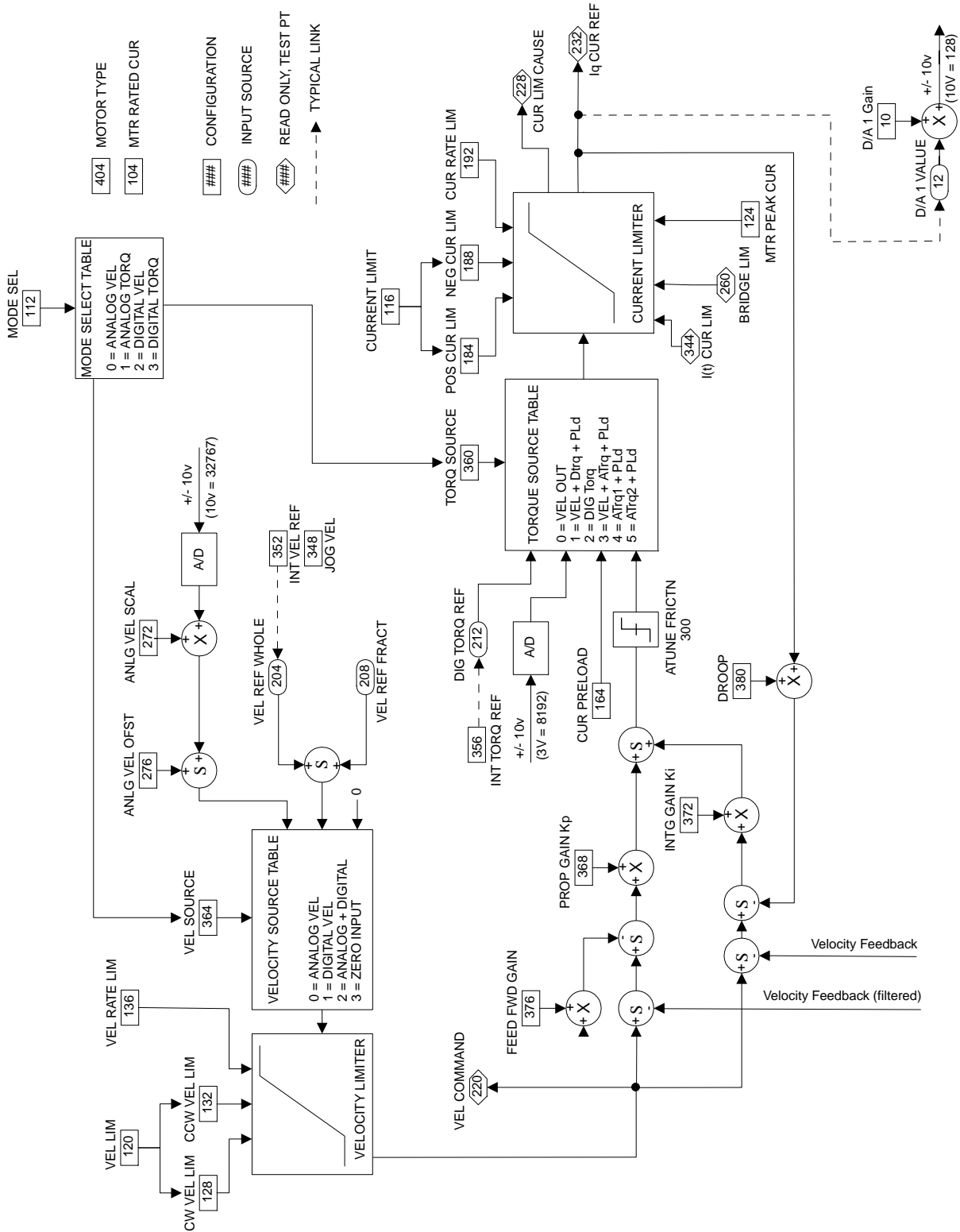
Add the following MP-Series motors to the [Motor Type] parameter on page 8-16.

| [Motor Type] | Selections | |
|--|------------|--------------|
| Note: Motors numbered 38-46 are available with Firmware version 7.01 or later. | 38 | "MPL-B310P" |
| | 39 | "MPL-B320P" |
| | 40 | "MPL-B330P" |
| | 41 | "MPL-B420P" |
| | 42 | "MPL-B430P" |
| | 43 | "MPL-B4520P" |
| | 44 | "MPL-B4530F" |
| | 45 | "MPL-B4530K" |
| | 46 | "MPL-B4540F" |

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Replace Figure 8.1 on page 8-28 with the figure below. The *ATUNE FRICTN* parameter has been corrected.

1394 Analog Servo Software (part 1)



Page A-5

Replace the *User-Supplied 24V Logic Input Power* table on page A-5 with the table below. The heading for current has changed.

| 24V Logic Input Voltage | Frequency | Current ¹ | | Recommended Fuse |
|--------------------------------|-----------|----------------------|----------------------------------|--------------------------------|
| | | If you have: | The minimum current required is: | |
| 19-28V AC RMS, single phase or | 50/60 Hz | 1 axis | 3.5A | Bussmann® MDA-15 or equivalent |
| | | 2 axis | 4.4A | |
| 3 axis | | 5.2A | | |
| 4 axis | | 6.0A | | |
| 18.75-31.25V DC | | | | |

¹ The power supply must be rated for 15A or greater inrush current upon power up.

Page A-8

Replace the table near the top of page A-8 with the table below. The circuit breaker part number for the 1394x-SJT22-x system module has been corrected.

| Use System Module: | With Secondary Circuit Protection Device: | And Axis Module Combination: |
|--------------------|---|---|
| 1394x-SJT05-x | 1492-CB3-H300 | Any combination of AM03 and AM04 up to 4 axis modules. Any combination of AM03, AM04, and AM07 where no more than two AM07s are being used. Use of other combinations of axis modules with this system module may result in nuisance tripping on power up due to a higher inrush current. |
| | A 1492 device is not recommended for this option. | Other combinations of AM07, AM50, and AM75s. Some local electrical codes require that the circuit breaker rating not exceed 400% of the full load device current. The inrush current draw of the 1394 in some combinations exceeds the 30A breaker and will result in nuisance tripping. |
| 1394x-SJT10-x | 1492-CB3-H500 | All |
| 1394x-SJT22-x | | All |

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Page B-14

Add the following information to the section *Thermal Interconnect Diagrams* beginning on page B-14. The changes and additions to this section provide clarification for wiring the thermal switch to Series C axis modules and provide examples when using either 24V AC/DC or 120V AC power in the start/stop string.

Thermal Interconnect Diagrams

The examples shown on the following pages are for 1326AB/AS servo motors with resolver feedback (using 1326-CCU-xxx feedback cables). The motor thermal switch leads are in the motor power cable and attach to TB1 of the axis module (refer to figures B.2, B.3 and B.6 for motor/axis module interconnect diagrams).

The thermal circuit includes filtering on the TB1/TB2 connector board that is rated for 24V only. For TB1/TB2 wiring alternatives, refer to the table below.

| If: | Then: |
|--|--|
| 120V ac is used on the start/stop string | Option 1: Install a 24V pilot relay on the thermal switch circuit. |
| | Option 2: Bypass the TB1/TB2 terminations ¹ . |
| 24V is used on the start/stop string | Follow the wiring shown in the figure above. |

¹ When bypassing the TB1/TB2 terminations, ensure that unshielded motor power conductors are kept as short as possible at the drive, as they will radiate high levels of electrical noise.

ATTENTION



Implementation of safety circuits and risk assessment is the responsibility of the machine builder. Please reference international standards EN1050 and EN954 estimation and safety performance categories. For more information refer to *Understanding the Machinery Directive* (publication SHB-900).

Page B-15

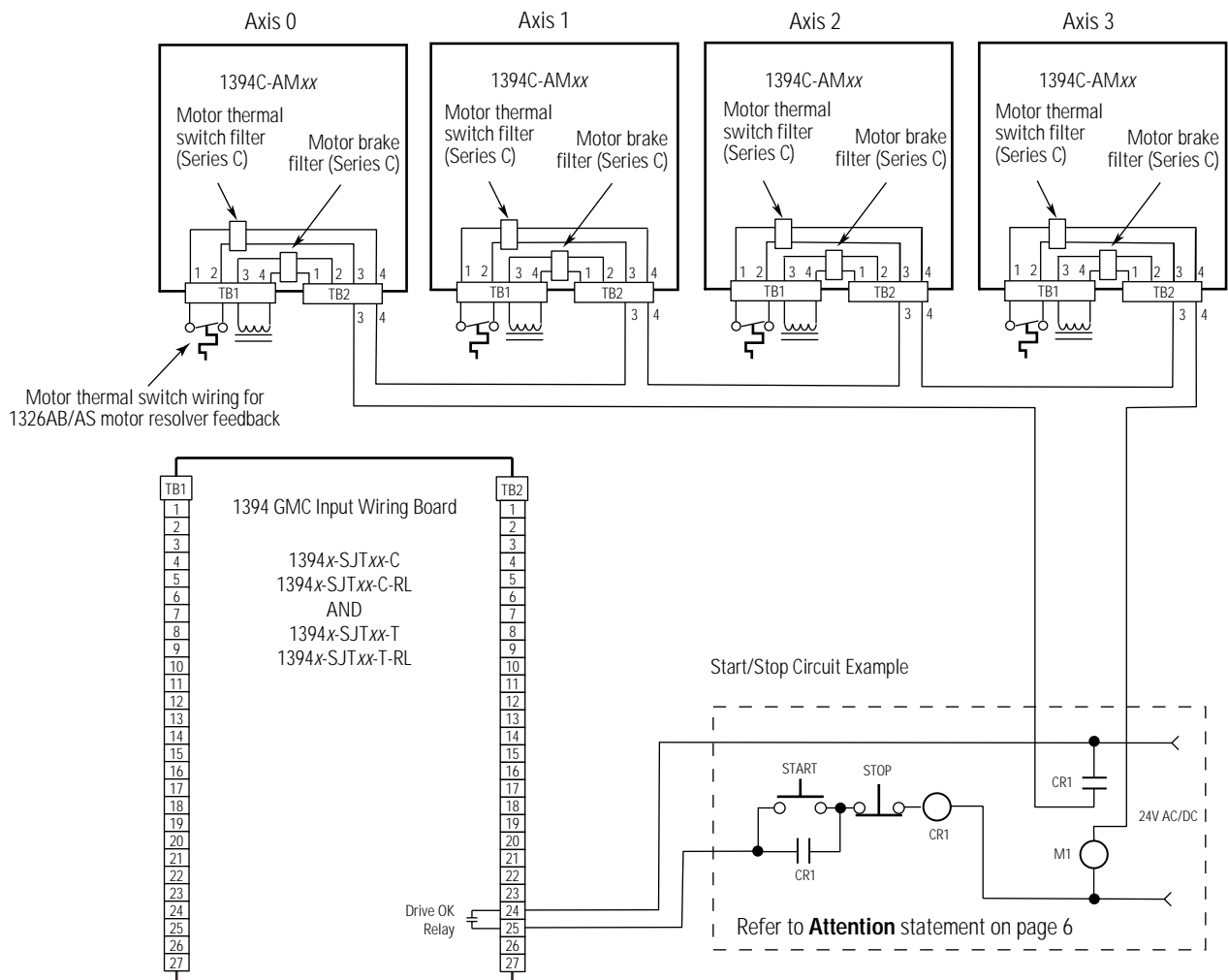
Add the following Attention statement and replace Figure B.8 with the figure below. The TB1/TB2 connector wiring has been modified for ease of use and the 120V AC power supply option for the start/stop circuit example has been removed.

ATTENTION



To avoid damage to the axis module TB1/TB2 circuitry, follow the example in the figure below only when your application includes 24V AC/DC for the start/stop circuit. The thermal circuit is rated for 24V AC/DC only.

Non-Isolated E-Stop for Series C Axis Modules



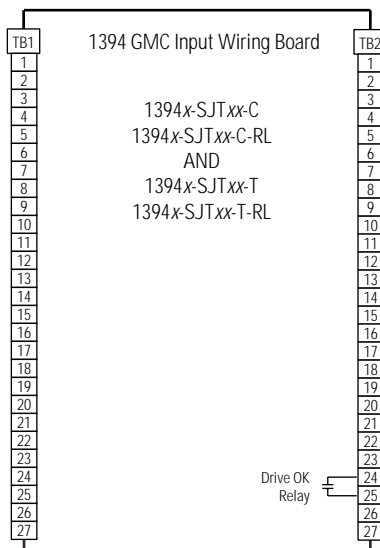
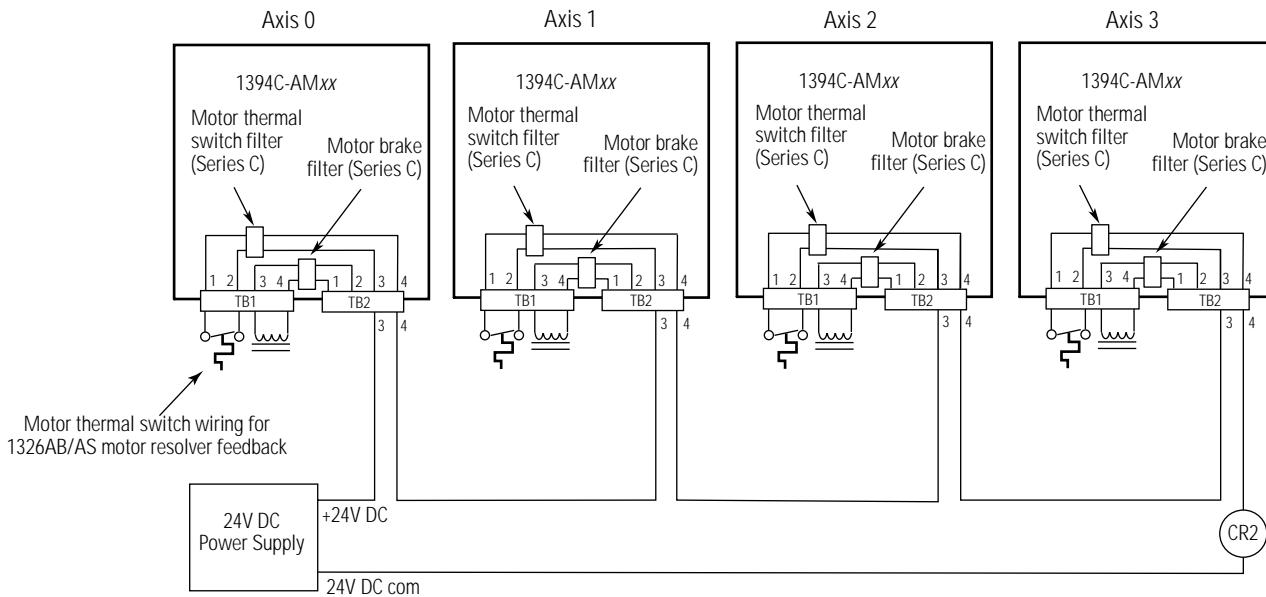
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Add the following Attention statement and figure following page B-15. This example allows thermal switch monitoring with 120V AC power for the start/stop circuit.

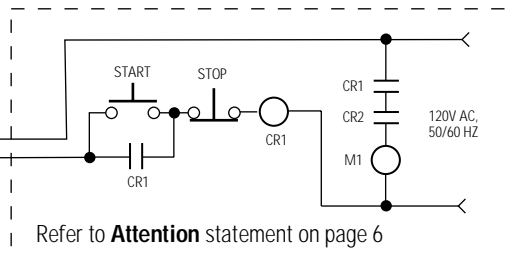


ATTENTION To avoid damage to the axis module TB1/TB2 circuitry, follow the example in the figure below when your application includes 120V AC for the start/stop circuit. The thermal circuit is rated for 24V AC/DC only and requires relay CR2.

Isolated E-Stop for Series C Axis Modules



Start/Stop Circuit Example



Refer to **Attention** statement on page 6

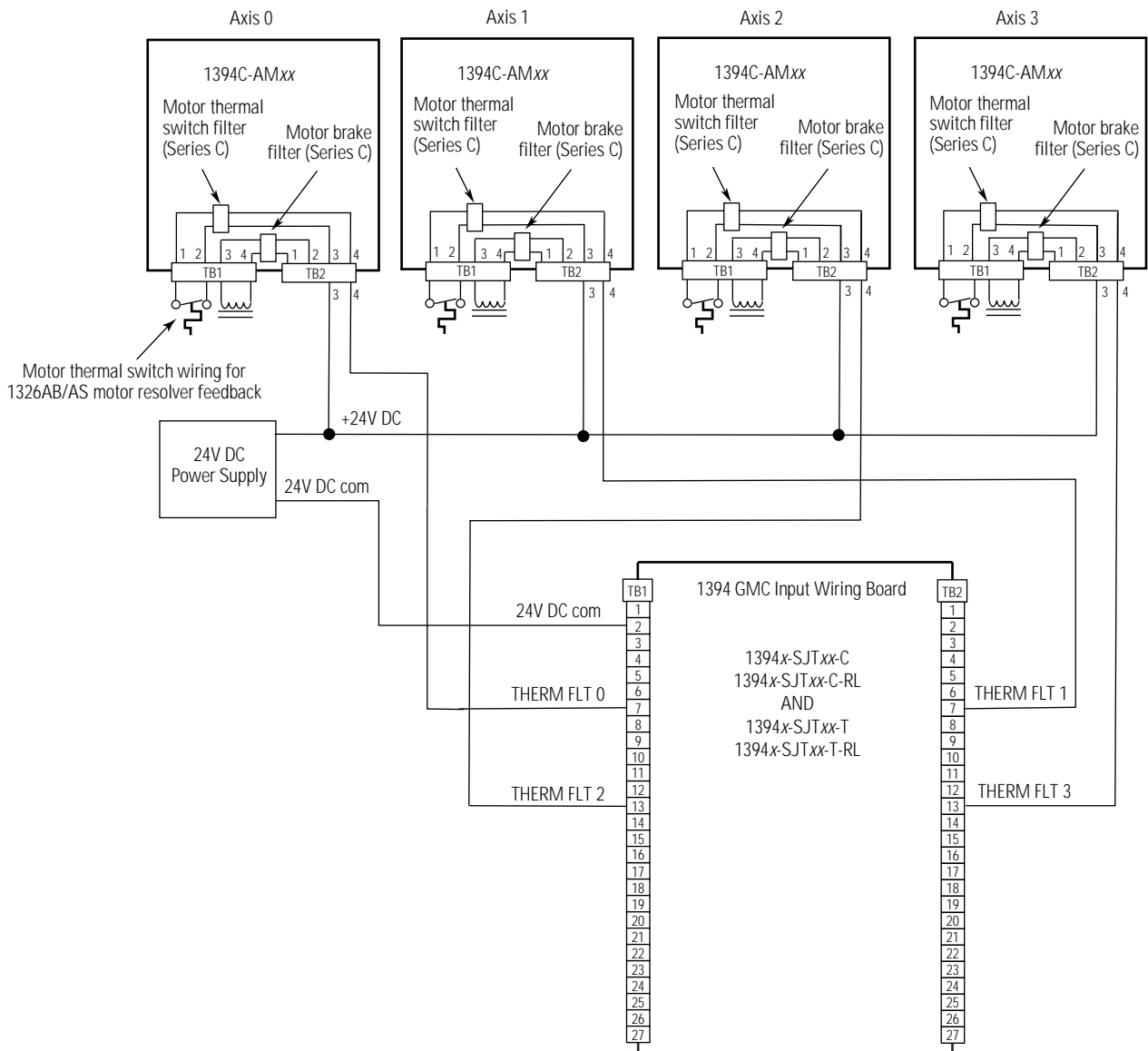
Add the following Attention statement and replace Figure B.9 with the figure below. The TB1/TB2 connector wiring has been modified for ease of use and the 120V AC power supply option has been removed.

ATTENTION



To avoid damage to the axis module and wiring board TB1/TB2 circuitry, follow the example in the figure below. The thermal circuit is rated for 24V DC only.

Isolated E-Stop for Series C Axis Modules with Thermal Fault Monitoring



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Page B-19

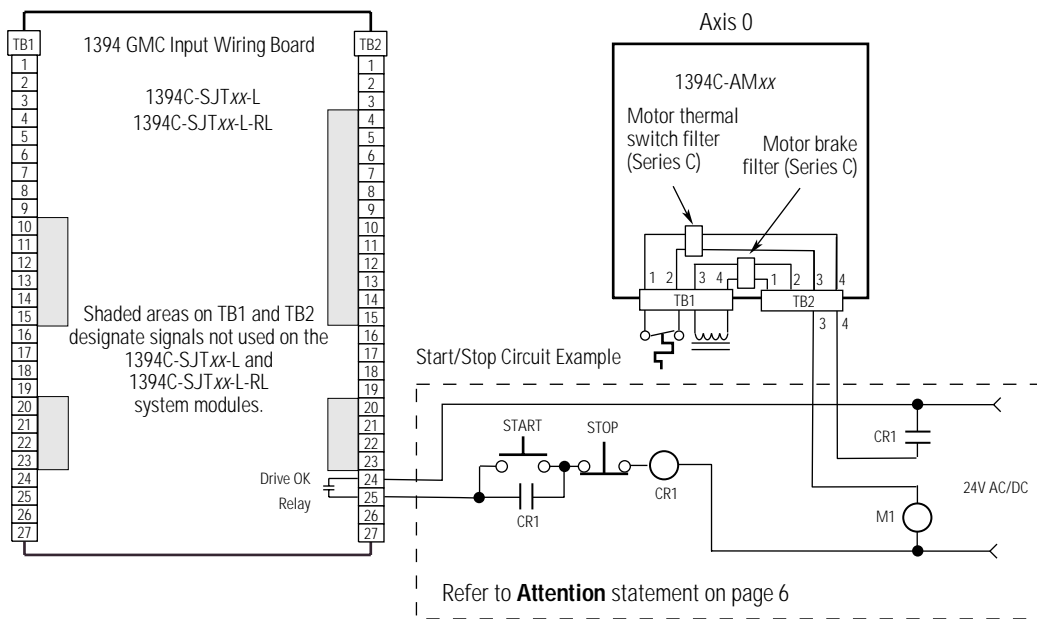
Add the following Attention statement and replace Figure B.12 with the figure below. The TB1/TB2 connector wiring has been modified for ease of use and the 120V AC power supply option for the start/stop circuit example has been removed.

ATTENTION



To avoid damage to the axis module TB1/TB2 circuitry, follow the example in the figure below only when your application includes 24V AC/DC for the start/stop circuit. The thermal circuit is rated for 24V AC/DC only.

Non-Isolated E-Stop for Series C Axis Modules



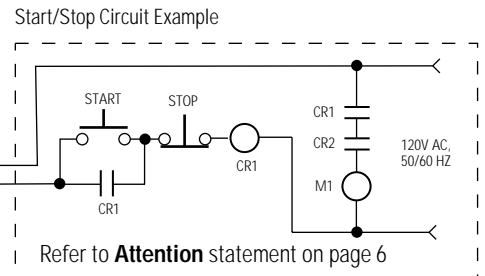
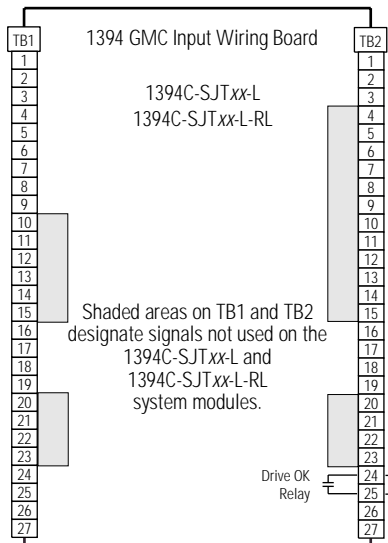
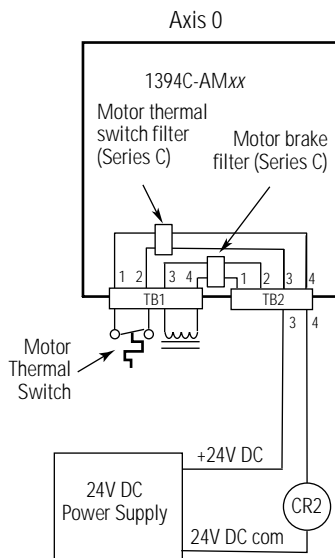
Add the following Attention statement and figure following figure B.12. This example allows thermal switch monitoring with 120V AC power for the start/stop circuit example.

ATTENTION



To avoid damage to the axis module TB1/TB2 circuitry, follow the example in the figure below when your application includes 120V AC for the start/stop circuit. The thermal circuit is rated for 24V AC/DC only and requires relay CR2.

Isolated E-Stop for Series C Axis Modules



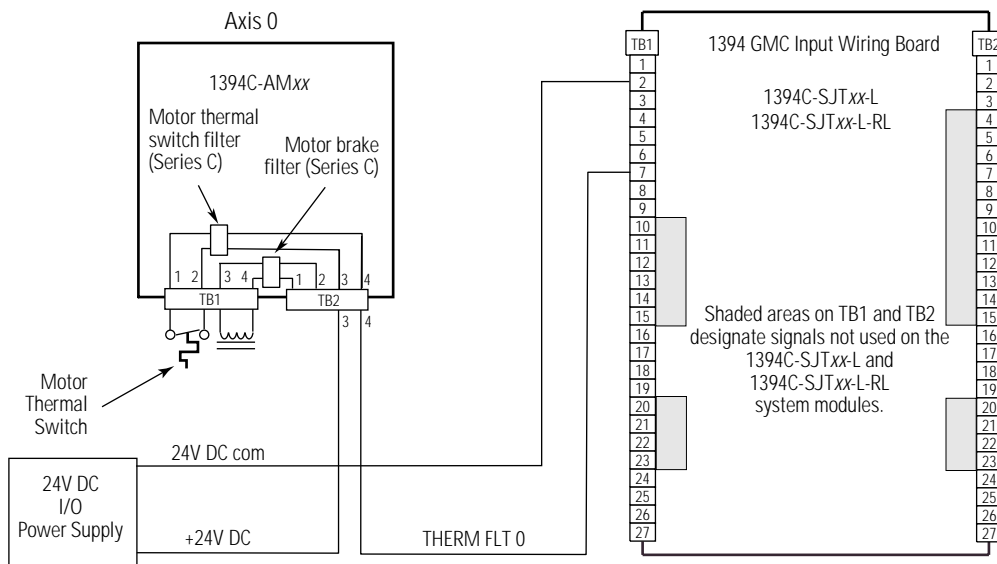
Add the following Attention statement and replace Figure B.13 with the figure below. The TB1/TB2 connector wiring has been modified for ease of use and the 120V AC power supply option has been removed.

ATTENTION



To avoid damage to the axis module and wiring board TB1/TB2 circuitry, follow the example in the figure below. The thermal circuit is rated for 24V DC only.

Non-Isolated E-Stop for Series C Axis Modules with Thermal Filter Monitoring



Page B-21

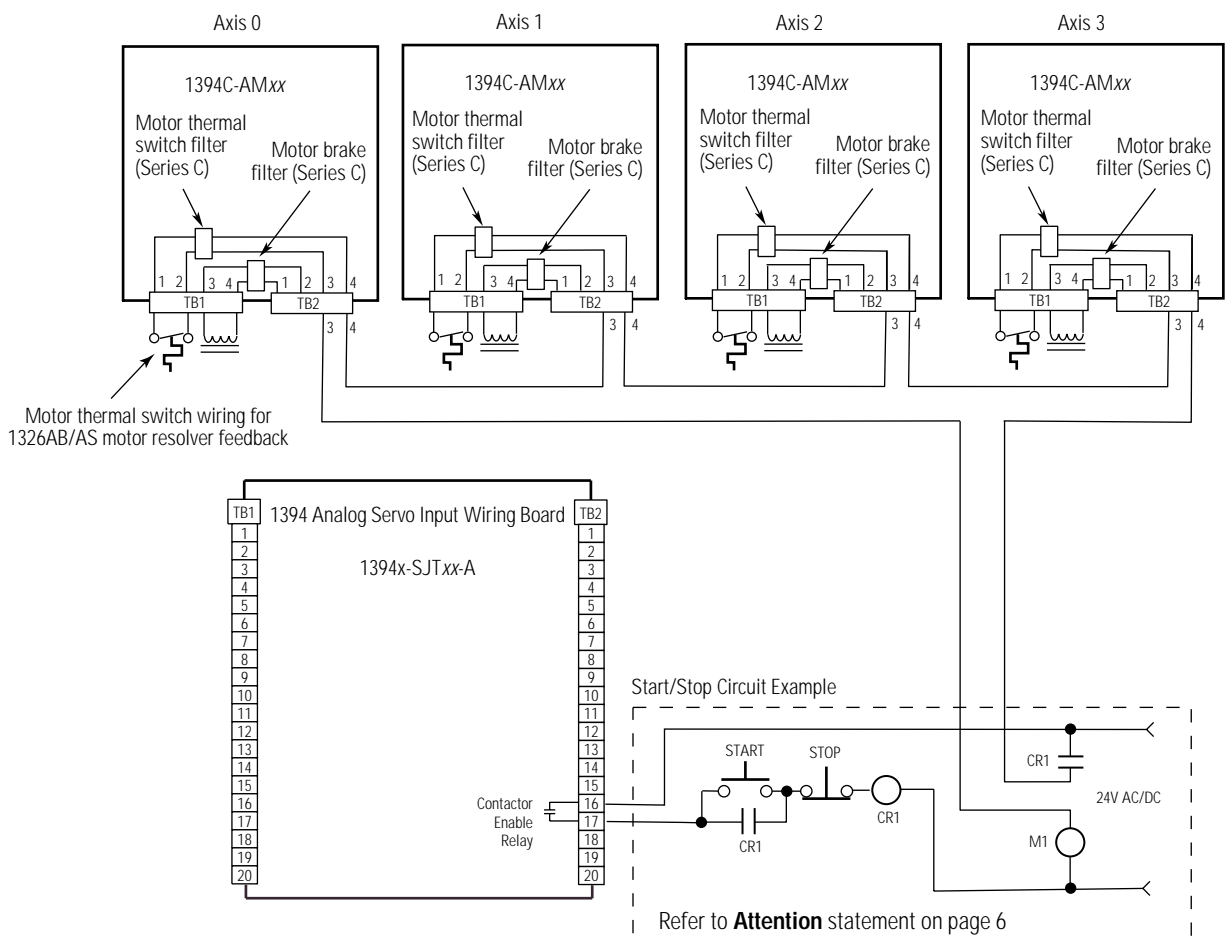
Add the following Attention statement and replace Figure B.16 with the figure below. The TB1/TB2 connector wiring has been modified for ease of use and the 120V AC power supply option for the start/stop circuit example has been removed.

ATTENTION




To avoid damage to the axis module TB1/TB2 circuitry, follow the example in the figure below only when your application includes 24V AC/DC for the start/stop circuit. The thermal circuit is rated for 24V AC/DC only.

Non-Isolated E-Stop for Series C Axis Modules

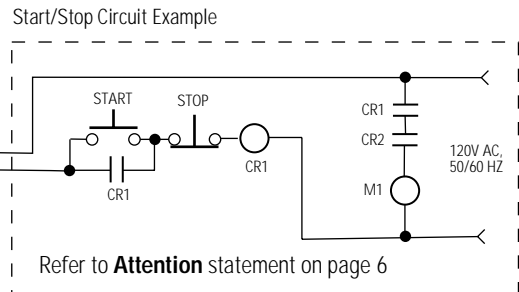
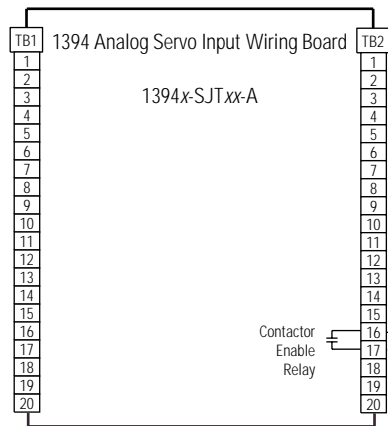
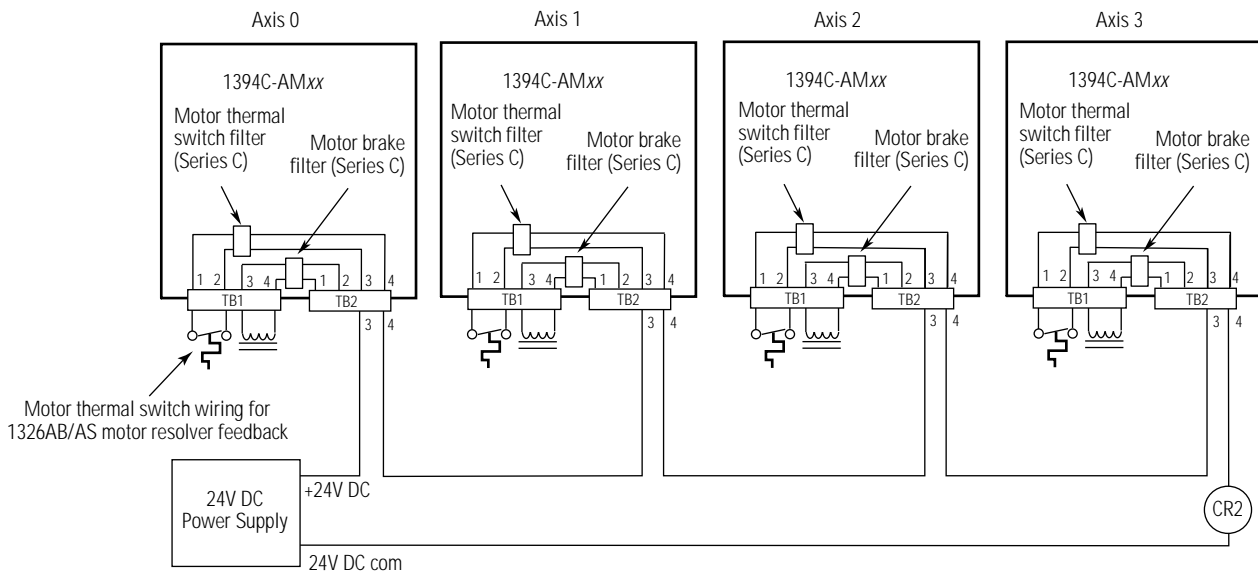


Add the following Attention statement and figure following page B-21. This example allows thermal switch monitoring with 120V AC power for the start/stop circuit example.

ATTENTION To avoid damage to the axis module TB1/TB2 circuitry, follow the example in the figure below when your application includes 120V AC for the start/stop circuit. The thermal circuit is rated for 24V AC/DC only and requires relay CR2.



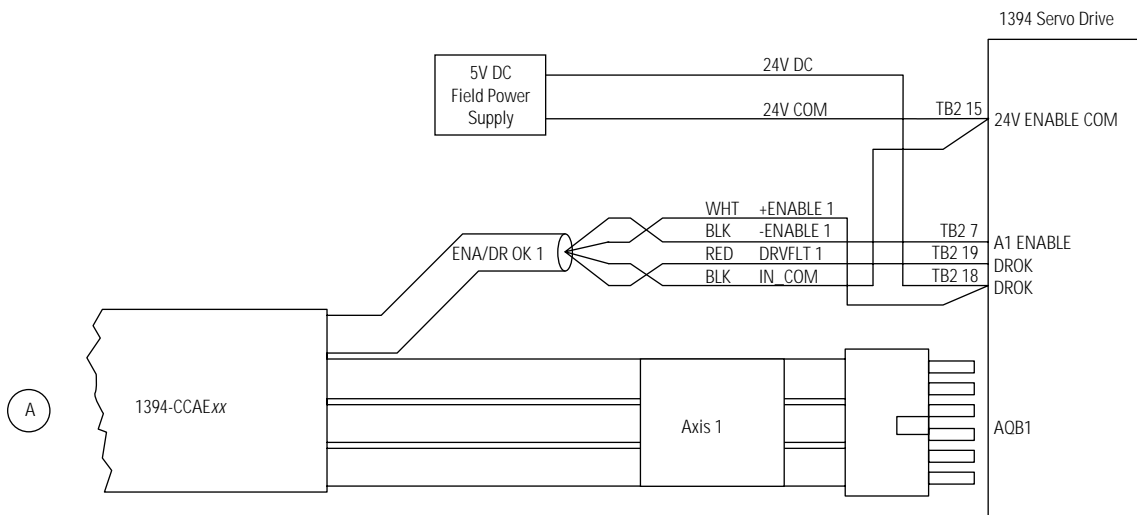
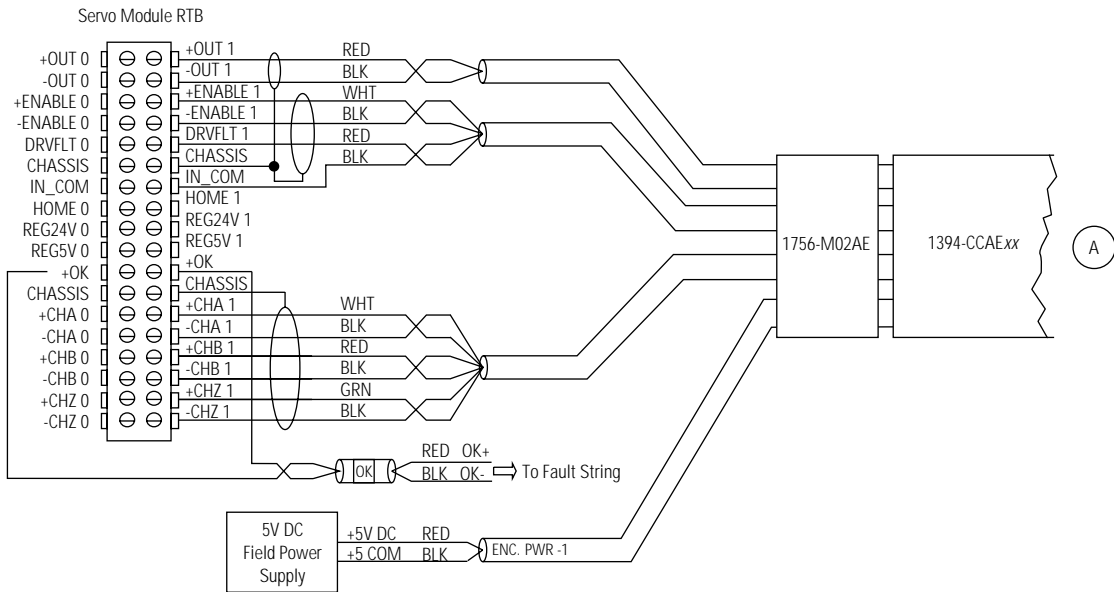
Isolated E-Stop for Series C Axis Modules



Page B-26

Add the following cable drawing to the *1394 Cable Pin-outs* section on page B-26. The drawing describes how the 1394-CCAExx cable connects between the 1394x-SJTxx-A system module and the 1756-M02AE motion module.

1394x-SJTxx-A to 1756-M02AE Cable Connection



Page C-10

Replace step 9 on page C-10 with the step 9 below. The added note describes an error condition you may encounter when using the copy cat function and the appropriate corrective action.

9. Press **ENTER**. A message similar to the following appears:

```
Drive -> HIM ##
```



Note: The numbers of the parameters scroll as they are copied and more solid boxes appear on the bottom to show the status of the copy.

Note: When copying parameters from older version firmware to newer (for example, 4.01 to 7.01) and the number of parameters is different, a SCANport™ error can occur during the copy function. To correct the error, record the parameter number that caused the error and press ENTER to continue copying parameters. When the copy function is complete, go back and update those parameters where the process stopped unless the default values are appropriate.

Page D-13

Add the following items to the *Miscellaneous Accessories* table on page D-13.

| Accessory | A-B® Catalog Number | Manufacturer's Number |
|--|---------------------|-----------------------|
| 1394-DIM connector kit | SP-74102-108-01 | N/A |
| 1394C power connector key kit | 1394C-CONN-KEY | N/A |
| Series C connector kit (includes power connectors, ground wires, feedback cable clamps, and ground bar screws) | SP-194238 | N/A |

For more information refer to our web site: www.ab.com/motion

For Allen-Bradley Technical Support information refer to: www.ab.com/support or Tel: (1) 440.646.5800

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