

ASB 3402R1
Control Board

Customer Reference Manual

Bonitron, Inc.



An Industry Leader in AC Drive Systems and Industrial Electronics

OUR COMPANY

Bonitron is an international supplier of power controls designed to improve the performance and reliability of electronic systems and variable frequency drives. Located in Nashville, Tennessee, and founded in 1962, Bonitron has gained a reputation for designing and manufacturing products with the highest possible degree of quality and reliability.

Bonitron has all the necessary resources in-house for complete electronic product development and manufacturing. Engineering facilities include a CAD lab for circuit board design and engineering labs for prototype testing and evaluation. Production facilities include production areas for circuit board assembly, a machine tool and sheet metal shop for chassis fabrication, and a systems assembly and checkout area. With these assets, Bonitron is positioned to be a leader into the future while maintaining first class support for their current customer base.

Worldwide sales of equipment are generated mainly by reputation and referrals. Our customer base includes all of the major drive manufacturers, their distributors, OEMs, end users, and many other satisfied companies. Equipment is installed throughout the United States as well as in Canada, Mexico, Costa Rica, Argentina, Brazil, Chile, Venezuela, Northern Ireland, the Netherlands, Spain, Hungary, Israel, Turkey, China, India, Indonesia, Singapore, Taiwan, and the Philippines.

TALENTED PEOPLE MAKING GREAT PRODUCTS

The engineering team at Bonitron has the background and expertise needed to design, develop, and manufacture the quality industrial systems demanded by today's client. A strong academic background supported by continuing education is complemented by many years of hands-on field experience. Expertise encompasses a broad range of applications and engineering solutions such as modern power conversion design techniques and microprocessor-based controls. This insures a solution tailored to the specific needs of the client.

A clear advantage that Bonitron has over many competitors is combined on-site engineering labs and manufacturing facilities. This allows the engineering team to have immediate access to and response from testing and manufacturing. This not only saves time during prototype development, but also is essential to providing only the best quality products.

AC DRIVE OPTIONS

In 1975, Bonitron began working with the AC inverter drive specialists at synthetic fiber plants to develop speed control systems that could be interfaced to their plant process computers. Since that time, Bonitron has developed AC drive option modules that help overcome many of the problems encountered in applications of modern AC variable frequency drives.

Bonitron's Ride-Thru module provides protection from AC line voltage sags while the Line Regen and Resistive Braking modules provide DC Bus regulation for over-voltage due to regenerated voltage.

Bonitron AC drive modules are available to provide Undervoltage, Overvoltage, Line Side, Load Side, Maintenance, Power Quality, and Green / Sustainability solutions. These products are compatible with the drives of all major manufacturers and have become the standard in many industries including semiconductor, oil, and fiber.

WORLD CLASS PRODUCTS

Bonitron has developed over 3000 different modules and systems. Bonitron is willing and able to meet the unique specifications the client may request.

Some Bonitron products include:

- Power Sag Ride-Thru Modules
- Power Outage Ride-Thru Modules
- Line Regen Modules
- Resistive Braking Modules
- Modular High Speed Precision AC Inverter Systems
- Inverter Upgrade Modules
- Multi-motor, Multi-phase Current Sensors
- Battery Production Charging Systems
- Data Acquisition Systems
- Process Controllers
- Temperature Control Systems
- RMS True Reading Digital Voltmeters, Ammeters, and Frequency Meters

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1. INTRODUCTION

1.1. WHO SHOULD USE

This manual is intended for use by anyone who is responsible for integrating, installing, maintaining, troubleshooting, or using this equipment with any AC Drive System.

Please keep this manual for future reference.

1.2. PURPOSE AND SCOPE

This manual is a user's guide for the 3402R1 Control Board. It will provide the user with the necessary information to successfully install, integrate, and use the 3402R1-interface card in a GV3000 AC drive.

In the event of any conflict between this document and any publication and/or documentation related to the AC drive system, the latter shall have precedence.

1.3. MANUAL VERSION AND CHANGE RECORD

This is the initial printing of the ASB 3402R1 manual.

Figure 1-1: Picture of the 3402R1



2. PRODUCT DESCRIPTION / FEATURES

The 115VAC Control Option board provides an interface between any of a number of external motor control devices operating at 115 volts AC and a GV3000 AC drive. The Control Option board accepts input from these devices and passes the signals to the drive's Regulator board.

3. INSTALLATION INSTRUCTIONS



Installation and/or removal of this product should only be performed by a qualified electrician in accordance with National Electrical Code or local codes and regulations.

Proper installation of the ASB 3402R1 should be accomplished following the steps outlined below. Be sure to refer to the AC Drive instruction manual as these steps are performed. Please direct all installation inquiries that may arise during the installation and start up of this product to the equipment supplier or system integrator.

3.1. INSTALLING THE 115VAC CONTROL OPTION BOARD IN 1 - 5HP AND 7.5 – 10HP DRIVES



Only qualified personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, and/or service this equipment. Read and understand this instruction manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.



The drive is at line voltage when connected to incoming AC power. Disconnect, lock out, and tag all incoming power to the drive before performing the following procedure. Failure to observe this precaution could result in severe bodily injury or loss of life.



DC bus capacitors retain hazardous voltages after input power has been disconnected. After disconnecting input power, wait five (5) minutes for the DC bus capacitors to discharge and then check the voltage with a voltmeter to ensure the DC bus capacitors are discharged before touching any internal components. Failure to observe this precaution could result in severe bodily injury or loss of life.



Do not route signal wiring with power wiring in the same conduit. This may cause interference with drive operation. Route signal and power wiring in separate conduit. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Use the following procedure to install a 115VAC Control Option board in 1 - 5hp and 7.5 - 10hp GV3000 drives. Refer to the instruction manual for your GV3000 drive as you perform this procedure.

- NOTE: Read and understand the warning labels on the drive before proceeding.

REMOVE THE KEYPAD SUPPORT BRACKET FROM THE DRIVE

1. Disconnect, lock out, and tag power to the drive.
2. Wait five (5) minutes for the DC bus capacitors to discharge.
3. Remove the cover by loosening the four (4) cover retaining screws.
4. Using a voltmeter, verify that there is no voltage at the drive's AC input power terminals (R/L1, S/L2, T/L3).

5. Check the DC bus potential (+, -terminals) with a voltmeter as described in the instruction manual for your drive to ensure that the DC bus capacitors are discharged.



The drive contains printed circuit boards that are static-sensitive. An anti-static wrist band should be worn by any person who touches the drive's components, connectors, or leads. Erratic machine operation and damage to, or destruction of, equipment may result if this procedure is not followed. Failure to observe this precaution may result in bodily injury.

6. Note the cable lead connections to the Regulator board terminal strip.
 - Record these connections now.
 - Then disconnect these cable leads from the Regulator board terminal strip.
7. Remove the three (3) M4 x 10 screws that fasten the bottom of the support bracket to the drive's heat sink.
 - NOTE: The bracket is connected to the drive by wiring. Do not attempt to lift the bracket out completely as this may damage or pull out the wiring.
8. Locate the Control Option board support tabs on the support bracket. They are below and behind the Regulator board. The Control Option board is attached to these tabs using the four screws and nuts provided.
9. Place a washer on each of the screws provided with the kit.
10. Hold the 115VAC Control Option board so the row of connectors is at the same end and faces the same direction as the row of connectors on the Regulator board.
11. Working from below the support tabs, line up the holes in the Control Option Board with the holes in the support tabs.
12. Insert one screw from below through the hole in the Control Option board and the hole in the support tab, and then thread a nut on the end of the screw. Repeat this procedure for the remaining three screws.
13. Hand tighten the screws and nuts holding the Control Option board in place until they are snug.

REINSTALL THE SUPPORT BRACKET

14. Align the support bracket with the mounting holes in the drive heat sink. Fasten the bracket with the three (3) M4 x 10 screws removed in Step 7.

WIRE THE CONTROL OPTION AND REGULATOR BOARDS

15. Wire your 115VAC supply to the correct TB1 terminals on the Control Option board. Refer to Table 3-1 and to Figure 3-2. Route the wire through the left-hand wire-routing hole at the bottom of the drive.
16. Wire your 115VAC control devices to the Control Option board's TB1 terminals and then wire the Control Option board's TB2 terminals to the corresponding terminals on the drive's Regulator board. Refer to Table 3-2, and Figures 3-1 and 3-2 in this instruction manual, and to the instruction manual for your drive. Route the wire through the left-hand wire-routing hole at the bottom of the drive.
17. Reconnect all cable leads to the appropriate terminals on the Regulator board. Refer to the terminal connections documented in Step 6 or to the appropriate instruction manual for the speed feedback device being used. Route the wire through the left-hand wire-routing hole at the bottom of the drive.

REINSTALL THE COVER AND APPLY POWER

18. Reinstall the cover. Align all cover screws into the heat sink before tightening any of them. (For NEMA 4X/12 covers, refer to the appropriate section in your drive's installation manual.)
19. Remove the lockout and tag. Apply power to the drive. SELF will be displayed while the drive performs power-up diagnostics.

Hardware installation of the 115VAC Control Option board in 1 - 5hp and 7.5 - 10hp GV3000 drives is complete.

3.2. INSTALLING THE 115VAC CONTROL OPTION BOARD IN 15-25HP DRIVES



Only qualified personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, and/or service this equipment. Read and understand this instruction manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.



The drive is at line voltage when connected to incoming AC power. Disconnect, lock out, and tag all incoming power to the drive before performing the following procedure. Failure to observe this precaution could result in severe bodily injury or loss of life.



DC bus capacitors retain hazardous voltages after input power has been disconnected. After disconnecting input power, wait five (5) minutes for the DC bus capacitors to discharge and then check the voltage with a voltmeter to ensure the DC bus capacitors are discharged before touching any internal components. Failure to observe this precaution could result in severe bodily injury or loss of life.



Do not route signal wiring with power wiring in the same conduit. This may cause interference with drive operation. Route signal and power wiring in separate conduit. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Use the following procedure to install a 115VAC Control Option board in 15 - 25hp GV3000 drives. Refer to the instruction manual for your GV3000 drive as you perform this procedure.

- NOTE: Read and understand the warning labels on the drive before proceeding.

REMOVE THE KEYPAD SUPPORT BRACKET FROM THE DRIVE

1. Disconnect, lock out, and tag power to the drive.
2. Wait five (5) minutes for the DC bus capacitors to discharge.
3. Remove the cover by loosening the four (4) cover retaining screws.
4. Using a voltmeter, verify that there is no voltage at the drive's AC input power terminals (R/L1, S/L2, T/L3).
5. Check the DC bus potential (+, -terminals) with a voltmeter as described in the instruction manual for your drive to ensure that the DC bus capacitors are discharged.



The drive contains printed circuit boards that are static-sensitive. An anti-static wrist band should be worn by any person who touches the drive's components, connectors, or leads. Erratic machine operation and damage to, or destruction of, equipment may result if this procedure is not followed. Failure to observe this precaution may result in bodily injury.

6. Note the cable lead connections to the Regulator board terminal strip.
 - Record these connections now.
 - Then disconnect these cable leads from the Regulator board terminal strip.

7. Loosen the thumbscrew on the left side of the keypad support bracket to release it from the bottom support bracket. Grasp the keypad support bracket on the left-hand side and lift it up and to the left to separate it from the bottom support bracket.
 - NOTE: The bracket is connected to the drive by wiring. Do not attempt to lift the bracket out completely as this may damage or pull out the wiring.
8. Locate the Control Option board support tabs on the support bracket. They are below and behind the Regulator board. The Control Option board is attached to these tabs using the four screws and nuts provided.
9. Place a washer on each of the screws provided with the kit.
10. Hold the 115VAC Control Option board so the row of connectors is at the same end and faces the same direction as the row of connectors on the Regulator board.
11. Working from below the support tabs, line up the holes in the Control Option Board with the holes in the support tabs.
12. Insert one screw from below through the hole in the Control Option board and the hole in the support tab, and then thread a nut on the end of the screw. Repeat this procedure for the remaining three screws.
13. Hand tighten the screws and nuts holding the Control Option board in place until they are snug.

REINSTALL THE SUPPORT BRACKET

14. Reconnect the keypad support bracket to the bottom bracket by inserting the mounting tabs into the slots in the bottom bracket and tightening the thumbscrew.

WIRE THE CONTROL OPTION AND REGULATOR BOARDS

15. Wire your 115VAC supply to the correct TB1 terminals on the Control Option board. Refer to Table 3-1 and to Figure 3-2. Route the wire through the left-hand wire-routing hole at the bottom of the drive.
16. Wire your 115VAC control devices to the Control Option board's TB1 terminals and then wire the Control Option board's TB2 terminals to the corresponding terminals on the drive's Regulator board. Refer to Table 3-2, and Figures 3-1 and 3-2 in this instruction manual, and to the instruction manual for your drive. Route the wire through the left-hand wire-routing hole at the bottom of the drive.
17. Reconnect all cable leads to the appropriate terminals on the Regulator board. Refer to the terminal connections documented in Step 6 or to the appropriate instruction manual for the speed feedback device being used. Route the wire through the left-hand wire-routing hole at the bottom of the drive.

REINSTALL THE COVER AND APPLY POWER

18. Reinstall the cover. Align all cover screws into the heat sink before tightening any of them. (For NEMA 4X/12 covers, refer to the appropriate section in your drive's installation manual.)
 19. Remove the lockout and tag, and apply power to the drive. SELF will be displayed while the drive performs power-up diagnostics.
- Hardware installation of the 115VAC Control Option board in 15 - 25hp GV3000 drives is complete.

3.3. INSTALLING THE 115VAC CONTROL OPTION BOARD IN 25-60HP DRIVES



Only qualified personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, and/or service this equipment. Read and understand this instruction manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.



The drive is at line voltage when connected to incoming AC power. Disconnect, lock out, and tag all incoming power to the drive before performing the following procedure. Failure to observe this precaution could result in severe bodily injury or loss of life.



DC bus capacitors retain hazardous voltages after input power has been disconnected. After disconnecting input power, wait five (5) minutes for the DC bus capacitors to discharge and then check the voltage with a voltmeter to ensure the DC bus capacitors are discharged before touching any internal components. Failure to observe this precaution could result in severe bodily injury or loss of life.



Do not route signal wiring with power wiring in the same conduit. This may cause interference with drive operation. Route signal and power wiring in separate conduit. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Use the following procedure to install a 115VAC Control Option board in 25 - 60hp GV3000 drives. Refer to the instruction manual for your GV3000 drive as you perform this procedure.

- NOTE: Read and understand the warning labels on the drive before proceeding.

REMOVE THE KEYPAD SUPPORT BRACKET FROM THE DRIVE

1. Disconnect, lock out, and tag power to the drive.
2. Wait five (5) minutes for the DC bus capacitors to discharge.
3. Remove the cover by loosening the six (6) cover retaining screws.
4. Using a voltmeter, verify that there is no voltage at the drive's AC input power terminals (R/L1, S/L2, T/L3).
5. Remove the two (2) screws from the top of the hinged panel on which the keypad support bracket is mounted, then tilt the mounting panel forward out of the drive chassis.
6. Check the DC bus potential (+, -terminals) with a voltmeter as described in the instruction manual for your drive to ensure that the DC bus capacitors are discharged.



The drive contains printed circuit boards that are static-sensitive. An anti-static wrist band should be worn by any person who touches the drive's components, connectors, or leads. Erratic machine operation and damage to, or destruction of, equipment may result if this procedure is not followed. Failure to observe this precaution may result in bodily injury.

7. Swing the hinged mounting panel back into position in the drive chassis.
8. Note the cable lead connections to the Regulator board terminal strip.
 - Record these connections now.
 - Then disconnect these cable leads from the Regulator board terminal strip.
9. Remove the four (4) screws and lock washers that fasten the keypad support bracket to the hinged mounting panel. Set aside the screws and lock washers for later use.
 - NOTE: The bracket is connected to the drive by wiring. Do not attempt to lift the bracket out completely as this may damage or pull out the wiring.
10. Locate the Control Option board support tabs on the support bracket. They are below and behind the Regulator board. The Control Option board is attached to these tabs using the four screws and nuts provided.
11. Place a washer on each of the screws provided with the kit.
12. Hold the 115VAC Control Option Board so the row of connectors is at the same end and faces the same direction as the row of connectors on the Regulator board.
13. Working from below the support tabs, line up the holes in the Control Option Board with the holes in the support tabs.
14. Insert one screw from below through the hole in the Control Option board and the hole in the support tab, and then thread a nut on the end of the screw. Repeat this procedure for the remaining three screws.
15. Hand tighten the screws and nuts holding the Control Option board in place until they are snug.

REINSTALL THE KEYPAD SUPPORT BRACKET

16. Reattach the keypad support bracket to the hinged mounting panel using the four (4) screws and lock washers removed in Step 9
17. Swing the hinged mounting panel back up into position. Make certain that the keypad ribbon connector is tucked into the cabinet and not pinched by the panel. Refasten the two (2) screws to the top of the panel.

WIRE THE CONTROL OPTION AND REGULATOR BOARDS

18. Wire your 115VAC supply to the correct TB1 terminals on the Control Option board. Refer to Table 3-1 and to Figure 3-2. Route the wire through the right-hand wire-routing hole at the bottom of the drive.
19. Wire your 115VAC control devices to the Control Option board's TB1 terminals and then wire the Control Option board's TB2 terminals to the corresponding terminals on the drive's Regulator board. Refer to Table 3-2, and Figures 3-1 and 3-2 in this instruction manual, and to the instruction manual for your drive.
20. Reconnect all cable leads to the appropriate terminals on the Regulator board. Refer to the terminal connections documented in Step 8 or to the appropriate instruction manual for the speed feedback device being used. Route the wire through the right-hand wire-routing hole at the bottom of the drive, away from the AC lines.

REINSTALL THE COVER AND APPLY POWER

21. Reinstall the cover. Align all cover screws into the heat sink before tightening any of them. Make certain that no wires or cables are being pinched by the cover. (For NEMA 4X/12 covers, refer to the appropriate section in your drive's installation manual.)

22. Remove the lockout and tag, and apply power to the drive. SELF will be displayed while the drive performs power-up diagnostics.

Hardware installation of the 115VAC Control Option board in 25 - 60hp GV3000 drives is complete.

3.4. INSTALLING THE 115VAC CONTROL OPTION BOARD IN 60 - 100HP AND 100 - 150HP DRIVES



Only qualified personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, and/or service this equipment. Read and understand this instruction manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.



The drive is at line voltage when connected to incoming AC power. Disconnect, lock out, and tag all incoming power to the drive before performing the following procedure. Failure to observe this precaution could result in severe bodily injury or loss of life.



DC bus capacitors retain hazardous voltages after input power has been disconnected. After disconnecting input power, wait five (5) minutes for the DC bus capacitors to discharge and then check the voltage with a voltmeter to ensure the DC bus capacitors are discharged before touching any internal components. Failure to observe this precaution could result in severe bodily injury or loss of life.



Do not route signal wiring with power wiring in the same conduit. This may cause interference with drive operation. Route signal and power wiring in separate conduit. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Use the following procedure to install a 115VAC Control Option board in 60 - 100hp and 100 – 150hp GV3000 drives. Refer to the instruction manual for your GV3000 drive as you perform this procedure.

- NOTE: Read and understand the warning labels on the drive before proceeding.

REMOVE THE KEYPAD SUPPORT BRACKET FROM THE DRIVE

1. Disconnect, lock out, and tag power to the drive.
2. Wait five (5) minutes for the DC bus capacitors to discharge.
3. Remove the cover by loosening the six (6) cover retaining screws.
4. Using a voltmeter, verify that there is no voltage at the drive's AC input power terminals (R/L1, S/L2, T/L3).
5. Loosen the two (2) screws from the top of the hinged panel on which the keypad support bracket is mounted, then tilt the mounting panel forward out of the drive chassis.
6. Check the DC bus potential (+, -terminals) with a voltmeter as described in the instruction manual for your drive to ensure that the DC bus capacitors are discharged.



The drive contains printed circuit boards that are static-sensitive. An anti-static wrist band should be worn by any person who touches the drive's components, connectors, or leads. Erratic machine operation and damage to, or destruction of, equipment may result if this procedure is not followed. Failure to observe this precaution may result in bodily injury.

7. Swing the hinged mounting panel back into position in the drive chassis.
8. Note the cable lead connections to the Regulator board terminal strip.
 - Record these connections now.
 - Then disconnect these cable leads from the Regulator board terminal strip.
9. Remove the four (4) screws and lock washers that fasten the keypad support bracket to the hinged mounting panel. Use a magnetic screwdriver to retain the screws and keep them from falling inside the drive. Be sure to hold the keypad support bracket as you remove the screws. Set aside the screws and lock washers for later use.
 - NOTE: The bracket is connected to the drive by wiring. Do not attempt to lift the bracket out completely as this may damage or pull out the wiring.
10. Locate the Control Option board support tabs on the support bracket. They are below and behind the Regulator board. The Control Option board is attached to these tabs using the four screws and nuts provided.
11. Place a washer on each of the screws provided with the kit.
12. Hold the 115VAC Control Option Board so the row of connectors is at the same end and faces the same direction as the row of connectors on the Regulator board.
13. Working from below the support tabs, line up the holes in the Control Option Board with the holes in the support tabs.
14. Insert one screw from below through the hole in the Control Option board and the hole in the support tab, and then thread a nut on the end of the screw. Repeat this procedure for the remaining three screws.
15. Hand tighten the screws and nuts holding the Control Option board in place until they are snug.

REINSTALL THE KEYPAD SUPPORT BRACKET

16. Reattach the keypad support bracket to the hinged mounting panel using the four (4) screws and lock washers removed in Step 9
17. Swing the hinged mounting panel back up into position. Make sure that no wires or cables are pinched by the panel. Refasten the two (2) screws to the top of the panel.

WIRE THE CONTROL OPTION AND REGULATOR BOARDS

18. Wire your 115VAC supply to the correct TB1 terminals on the Control Option board. Refer to Table 3-1 and to Figure 3-2.
19. Wire your 115VAC control devices to the Control Option board's TB1 terminals and then wire the Control Option board's TB2 terminals to the corresponding terminals on the drive's Regulator board. Refer to Table 3-2, and Figures 3-1 and 3-2 in this instruction manual, and to the instruction manual for your drive.
20. Reconnect all cable leads to the appropriate terminals on the Regulator board. Refer to the terminal connections documented in Step 8 or to the appropriate instruction manual for the speed feedback device being used. Route the wire through the right-hand wire-routing hole at the bottom of the drive, away from the AC lines.

REINSTALL THE COVER AND APPLY POWER

21. Reinstall the cover. Align all cover screws into the heat sink before tightening any of them. Make certain that no wires or cables are being pinched by the cover.

22. Remove the lockout and tag, and apply power to the drive. SELF will be displayed while the drive performs power-up diagnostics.

Hardware installation of the 115VAC Control Option board in 60 - 100hp and 100 – 150hp GV3000 drives is complete.

3.5. INSTALLING THE 115VAC CONTROL OPTION BOARD IN 200 - 400HP DRIVES



Only qualified personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, and/or service this equipment. Read and understand this instruction manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.



The drive is at line voltage when connected to incoming AC power. Disconnect, lock out, and tag all incoming power to the drive before performing the following procedure. Failure to observe this precaution could result in severe bodily injury or loss of life.



DC bus capacitors retain hazardous voltages after input power has been disconnected. After disconnecting input power, wait five (5) minutes for the DC bus capacitors to discharge and then check the voltage with a voltmeter to ensure the DC bus capacitors are discharged before touching any internal components. Failure to observe this precaution could result in severe bodily injury or loss of life.



Do not route signal wiring with power wiring in the same conduit. This may cause interference with drive operation. Route signal and power wiring in separate conduit. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Use the following procedure to install a 115VAC Control Option board in 200 - 400hp GV3000 drives. Refer to the instruction manual for your GV3000 drive as you perform this procedure.

- NOTE: Read and understand the warning labels on the drive before proceeding.

REMOVE THE KEYPAD SUPPORT BRACKET FROM THE DRIVE

1. Disconnect, lock out, and tag power to the drive.
2. Wait five (5) minutes for the DC bus capacitors to discharge.
3. Open the drive cabinet
4. Using a voltmeter, verify that there is no voltage at the drive's AC input power terminals (R/L1, S/L2, T/L3).
5. Loosen the two (2) screws from the top of the hinged panel on which the keypad support bracket is mounted, then tilt the mounting panel forward out of the drive chassis.
6. Check the DC bus potential (+, -terminals) with a voltmeter as described in the instruction manual for your drive to ensure that the DC bus capacitors are discharged.



The drive contains printed circuit boards that are static-sensitive. An anti-static wrist band should be worn by any person who touches the drive's components, connectors, or leads. Erratic machine operation and damage to, or destruction of, equipment may result if this procedure is not followed. Failure to observe this precaution may result in bodily injury.

7. Swing the hinged mounting panel back into position in the drive chassis.
8. Note the cable lead connections to the Regulator board terminal strip.
 - Record these connections now.
 - Then disconnect these cable leads from the Regulator board terminal strip.
9. Remove the four (4) screws and lock washers that fasten the keypad support bracket to the hinged mounting panel. Use a magnetic screwdriver to retain the screws and keep them from falling inside the drive. Be sure to hold the keypad support bracket as you remove the screws. Set aside the screws and lock washers for later use.
 - NOTE: The bracket is connected to the drive by wiring. Do not attempt to lift the bracket out completely as this may damage or pull out the wiring.
10. Locate the Control Option board support tabs on the support bracket. They are below and behind the Regulator board. The Control Option board is attached to these tabs using the four screws and nuts provided.
11. Place a washer on each of the screws provided with the kit.
12. Hold the Control Option Board so the row of connectors is at the same end and faces the same direction as the row of connectors on the Regulator board.
13. Working from below the support tabs, line up the holes in the Control Option Board with the holes in the support tabs.
14. Insert one screw from below through the hole in the Control Option board and the hole in the support tab, and then thread a nut on the end of the screw. Repeat this procedure for the remaining three screws.
15. Hand tighten the screws and nuts holding the Control Option board in place until they are snug.

REINSTALL THE KEYPAD SUPPORT BRACKET

16. Reattach the keypad support bracket to the hinged mounting panel using the four (4) screws and lock washers removed in Step 9
17. Swing the hinged mounting panel back up into position. Make sure that no wires or cables are pinched by the panel. Refasten the two (2) screws to the top of the panel.

WIRE THE CONTROL OPTION AND REGULATOR BOARDS

18. Wire your 115VAC supply to the correct TB1 terminals on the Control Option board. Refer to Table 3-1 and to Figure 3-2.
19. Wire your 115VAC control devices to the Control Option board's TB1 terminals and then wire the Control Option board's TB2 terminals to the corresponding terminals on the drive's Regulator board. Refer to Table 3-2, and Figures 3-1 and 3-2 in this instruction manual, and to the instruction manual for your drive.
20. Reconnect all cable leads to the appropriate terminals on the Regulator board. Refer to the terminal connections documented in Step 8 or to the appropriate instruction manual for the speed feedback device being used. For wire routing, refer to your drive's instruction manual.

CLOSE THE COVER AND APPLY POWER

21. Close the cabinet cover.
22. Remove the lockout and tag, and apply power to the drive. SELF will be displayed while the drive performs power-up diagnostics.

Hardware installation of the 115VAC Control Option board in 200 - 400hp GV3000 drives is complete.

3.6. WIRING AND CUSTOMER CONNECTIONS

3.6.1. 115VAC CONTROL OPTION BOARD INPUT AND OUTPUT WIRING

Table 3-1: AC Source Input

AC INPUT	CONTROL OPTION BOARD TB1 TERMINAL STRIP
115 VAC	1
Neutral	2

Table 3-2: Control Option Board Wiring to GV3000 Regulator Board

CONTROL DEVICE	CONTROL OPTION BOARD TB1 TERMINAL STRIP		CONTROL OPTION BOARD TB1 TERMINAL STRIP	GV3000 REGULATOR BOARD TERMINAL STRIP
	115V SOURCE	CONTROL INPUT		
Digital input 8 (Remote / Local)	17	18	19	17
Function Loss	3	4	6	20
Stop	5	6	3	23
Start	7	8	2	24
Run / Jog	9	10	5	21
Digital Input 6 (FWD / REV)	11	12	7	19
Digital Input 7 (RAMP 1 / 2)	13	15	8	18
RESET	14	16	4	22
+24VDC Common	-	-	1	25
+24VDC	-	-	10	16

3.7. TYPICAL CONFIGURATIONS

Figure 3-1: Control Board Layout

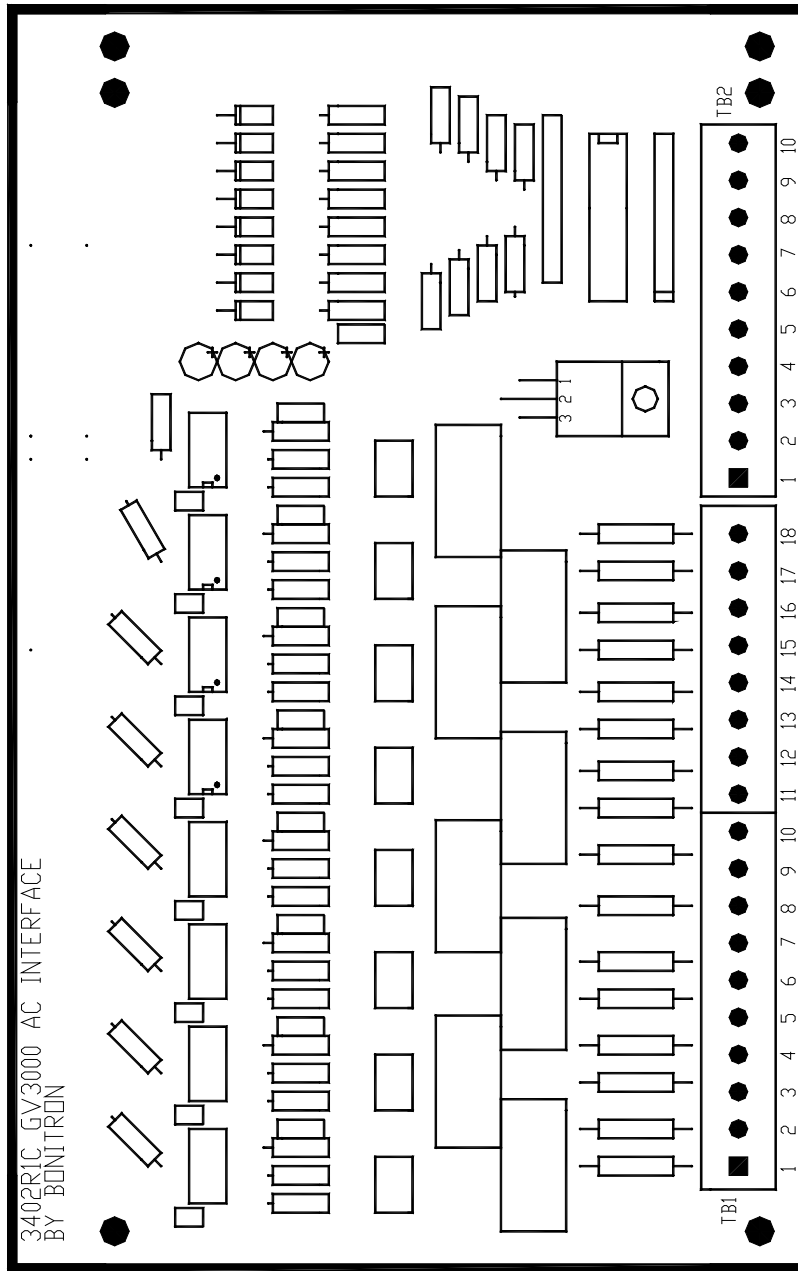
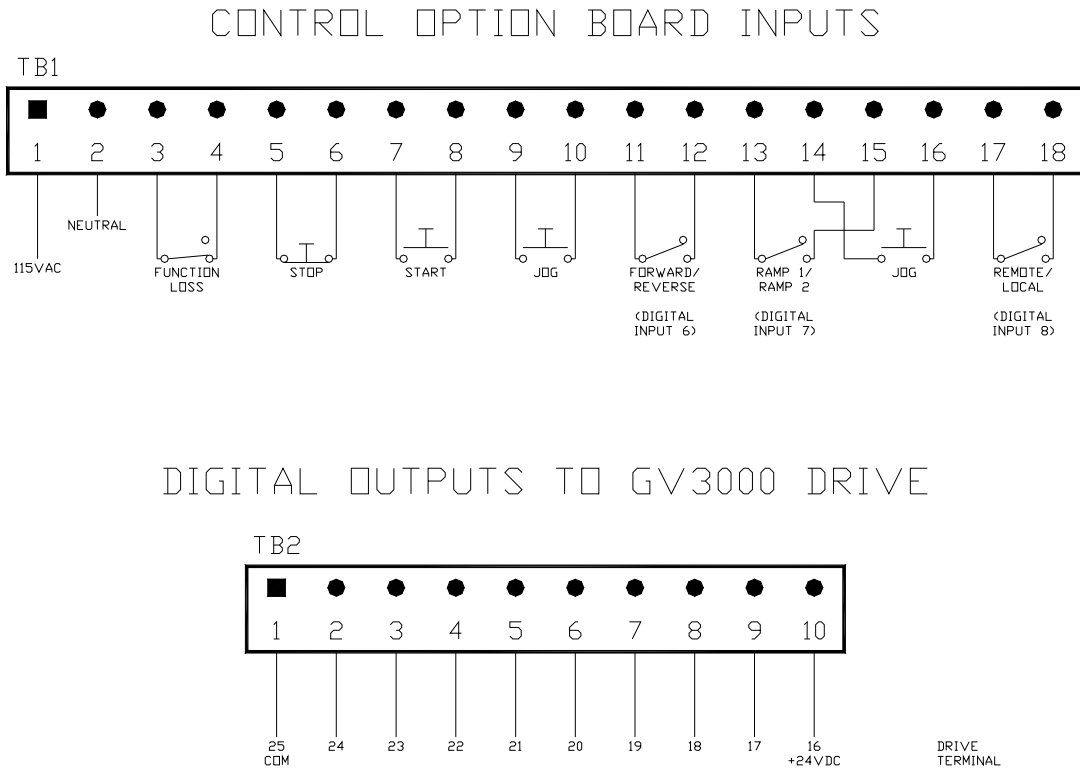


Figure 3-2: 115VAC Control Option Board Input and Output Connections



~NOTES~

1. 115V AND COMMON EXTERNAL SOURCES PROVIDED BY CUSTOMER.
