VC3500 User's Manual

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This manual was written and designed at Valco Cincinnati, Inc., 411 Circle Freeway Drive, Cincinnati, Ohio 45246.

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CE Declaration of Conformity

(according to EN 45014)

Manufacturer: Valco Cincinnati, Incorporated
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declares that the product:

Product Name: Glue Controller
Product Model(s): VC3500
Year of Manufacture: 1998

conforms to the following standards:

Safety: EN 60204-1

EMC Emissions: EN 50081-2
EN 55011, Class A

EMC Immunity: EN 50082-2
EN 61000-4-2
EN 61000-4-3
EN 61000-4-4

Degrees of Protection: EN60529-1, IP54

and complies with the requirements of:

Low Voltage Directive 73/23/EEC
EMC Directive 89/336/EEC

Office of CE Conformance
Cincinnati, Ohio USA

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Introduction

About this Manual

Valco Cincinnati has prepared this manual as an aid for installing, operating, and servicing the VC3500 control. This manual provides specific information about the unit, and general guidelines and references when discussing other equipment such as glue systems, scanners, encoders, and dispensing valves.

If you need more information, please contact your Valco Cincinnati representative.

Product Description

Valco's VC3500 is a sophisticated microprocessor control that provides precise adhesive delivery. The control can be designed for either two-channel, two-valve applications or four-channel, four-valve applications.

The VC3500 is used for applications where consistent glue patterns are required at high machine speeds and during speed changes. The VC3500 provides complex glue patterns that can be difficult or impossible to obtain with other systems. The control operator can use the control's front-panel touch-screen to edit glue patterns while the parent machine is operating.

The VC3500 features a user-friendly, multi-language display; multiple pattern placement; speeds of up to 2000 feet (610 m) per minute; internal flow control; and optional RS-232 communications with external devices. The VC3500 control can store up to 99 fully programmed jobs.

Safety Information

General Information

It is the purchaser's responsibility to ensure that all local, county, state, and national codes, regulations, rules, and laws relating to safety and safe operating conditions are met and followed.

The best safeguard is trained personnel. The purchaser is responsible for providing personnel who are adequately trained to install, operate, and maintain Valco components and systems.

This section contains information that is essential to the safety of personnel. Safety information is included throughout the rest of the manual as well. The following safety conventions are used to indicate potential safety hazards:

WARNING! This symbol indicates the presence of un-insulated dangerous voltage within the product's enclosure. This voltage may cause electrical shock or fire. Failure to observe precaution may result in death, personal injury, and/or equipment damage.

WARNING! This convention is used to alert the user to important installation, operation, and/or maintenance information. Failure to observe precaution may result in personal injury or death.

CAUTION! This convention is used to alert the user to important installation, operation, and/or maintenance information. Failure to observe precaution may result in damage to equipment.

Warnings

All personnel involved with the installation, operation, and maintenance of the equipment must read and thoroughly understand the following warnings:

WARNING! Promptly repair or replace all worn or damaged electrical wiring and equipment wires to avoid danger to personnel.

WARNING! Properly route all electrical wires to avoid danger to personnel and damage to moving parts of machine.

WARNING! Disconnect all power before opening the control. Only qualified personnel should open and service the control.

WARNING! When making adjustments or performing checkout procedures, stay clear of any moving mechanical parts and do not touch exposed electrical equipment or electrical connectors.

WARNING! Keep pump cover and electrical enclosures closed except during setup, service, and checkout procedures.

WARNING! Promptly repair or replace all worn or damaged parts.

Routing Low-Voltage Leads

Electrical installation should be accomplished only by experienced service personnel!

When routing low-voltage leads, follow these guidelines:

- Do not route low-voltage leads in the same conduit as wires carrying a high-current load.
- Do not route low-voltage leads adjacent to, or across wires carrying a high-current load. If low-voltage leads must cross or run parallel to wires carrying high current, keep the leads at least 6" (152 mm) from high-current wires.
- Do not splice or solder leads.
- Trim leads to the required length. Leads should be only as long as necessary for installation.
- All wiring should be in conduits or wireways.

Connecting the Supply of Electrical Power

Electrical connections should be made only by experienced service personnel!

The control must be connected to a "clean" supply of electrical power. Use a dedicated circuit if possible—if a dedicated circuit is not available, do ***not*** connect the control to a circuit that supplies high-amperage equipment. Use another circuit such as a lighting circuit.

Introduction

This section describes the basic features of the 3500 control.

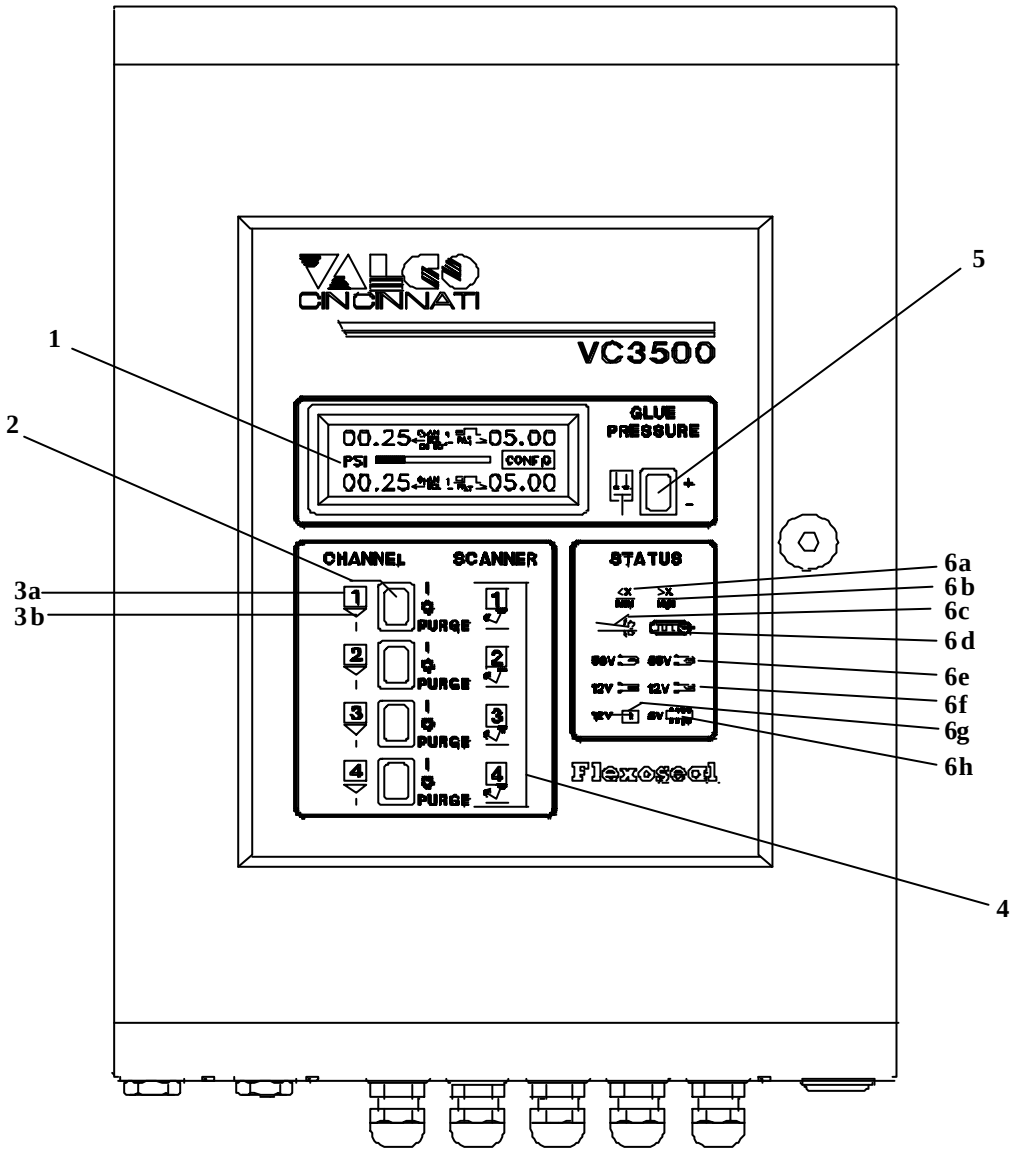


Figure 1. Front Panel of VC3500

Front-Panel Features

The following are descriptions of the features on the front panel (see Figure 1).

1 Touch-screen display

All glue pattern parameters are entered and displayed using the touch-screen.

2 Valve enable switches

"|"—Valve is enabled and ready to dispense glue under program control.

"0"—Valve is disabled and will not dispense glue.

PURGE—Valve will dispense glue as long as the switch is manually held in this position.

3 Valve indicator lights (items 3a and 3b are valve indiator lights)

3a Valve enable indicator lights

This light illuminates when the valve enable switch is placed in the "|" (enabled) position (see item 2). This light will not illuminate when the valve enable switch is placed in the "0" (disabled) position.

3b Valve dispensing indicator lights

This light illuminates when the valve is dispensing glue (purge function or a programmed command).

4 Scanner indicator lights

This light illuminates when the scanner detects product.

5 Glue pressure adjustment

You press this button to adjust glue pressure ("+" = increase and " -" = decrease)

6 Status indicator lights

Items 6a through 6h are status indicator lights.

6a Less than minimum speed

"<X/MIN" illuminates when the speed of the parent machine is less than the minimum speed setting .

6b Greater than minimum speed

">X/MIN" illuminates when the speed of the parent machine is greater than the minimum speed setting.

6c Jam

This light illuminates when a scanner detects a product that is longer than the product length value entered in the control.

6d Encoder

This light illuminates when encoder pulses are received by the control.

6e 56V

"56V" illuminates when the 56-volt valve peak voltage is supplied.

6f 12V coil hold voltage

"12V" illuminates when the 12-volt valve hold voltage is supplied.

6g 12V input supply voltage

This light illuminates when the 12-volt supply for scanners and the encoder is operational. This light will be illuminated under normal operating conditions.

6h 5V logic supply voltage

This light illuminates when the 5-volt logic supply is operational. This light will be illuminated under normal operating conditions.

Bottom Panel Features

The following are descriptions of the features on the bottom panel (Figure 2).

1 **Air exhaust output**

This output is for air to exhaust to the atmosphere. It is not normally connected.

2 **Air input**

Input for regulated air, 80-100 psi (6.5–8 bar).

3 **Computer interface**

DB-9 socket for optional RS232 communications (standard DTE)

4 **Air output**

This output is connected to the glue source to provide speed-dependent glue pressure.

5 **Optional machine interface** (items 5a and 5b are machine interface connectors)

5a **Beacon/horn connector**

See the "Installation" section for wiring details.

5b **Machine interface relay connector**

See the "Installation" section for wiring details.

6 **Power module**

This main power supply connection uses an IEC standard line cord (supplied). The fuse drawer in this module provides fuses for both sides of the main supply and selection of either 115 or 230VAC. The on/off switch for the control is also located on this module.

Note! Ensure that the proper fuse configuration is installed to suit the power source. (See the "Installation" section for details.)

7 **Line cord clamp**

Two clamps are included in the installation kit. One clamp fits the included European line cord and the other clamp fits the included North American line cord. You use two 4-40x 3/8² screws to attach clamp to enclosure.

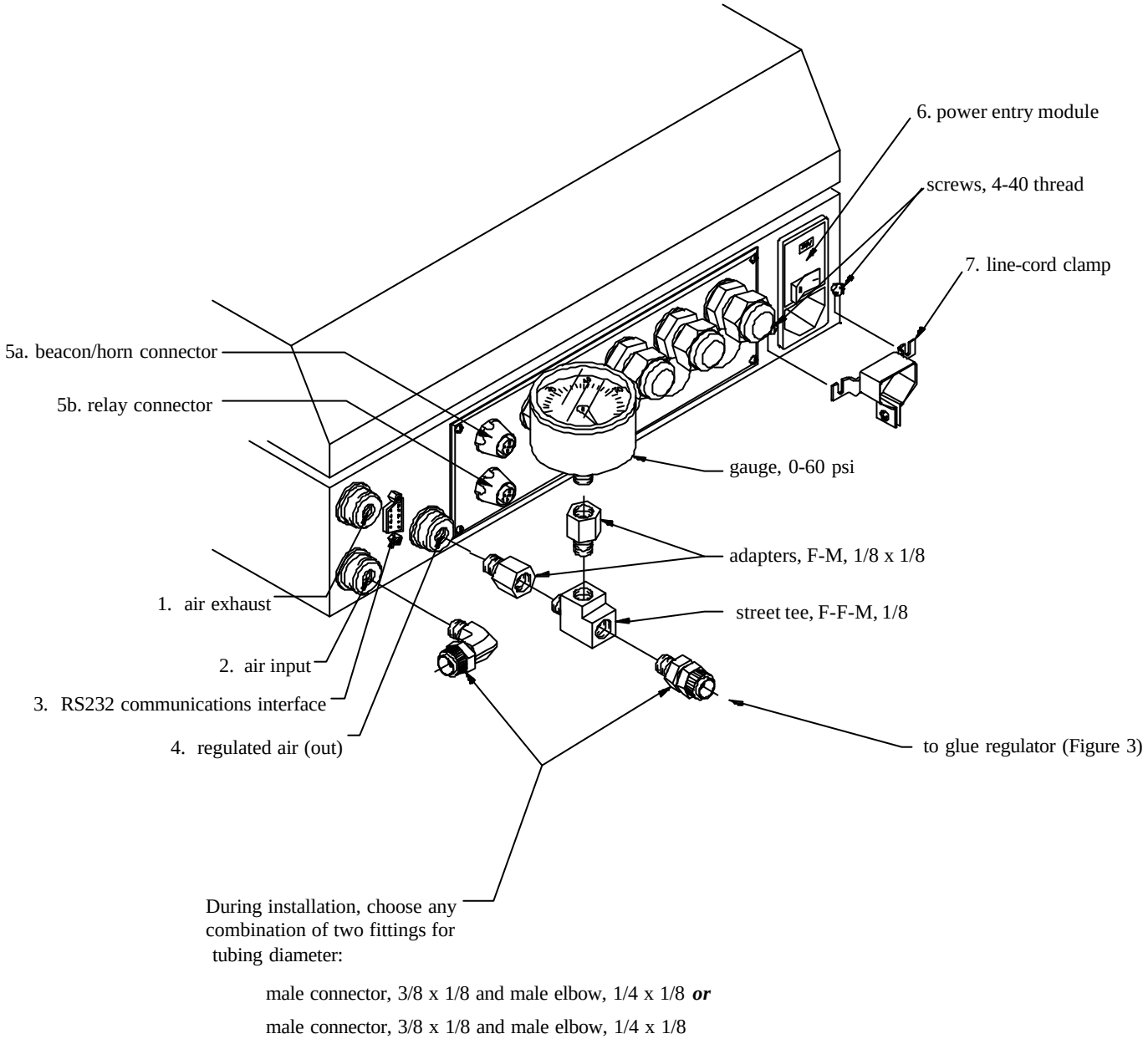


Figure 2. Bottom Panel of VC3700

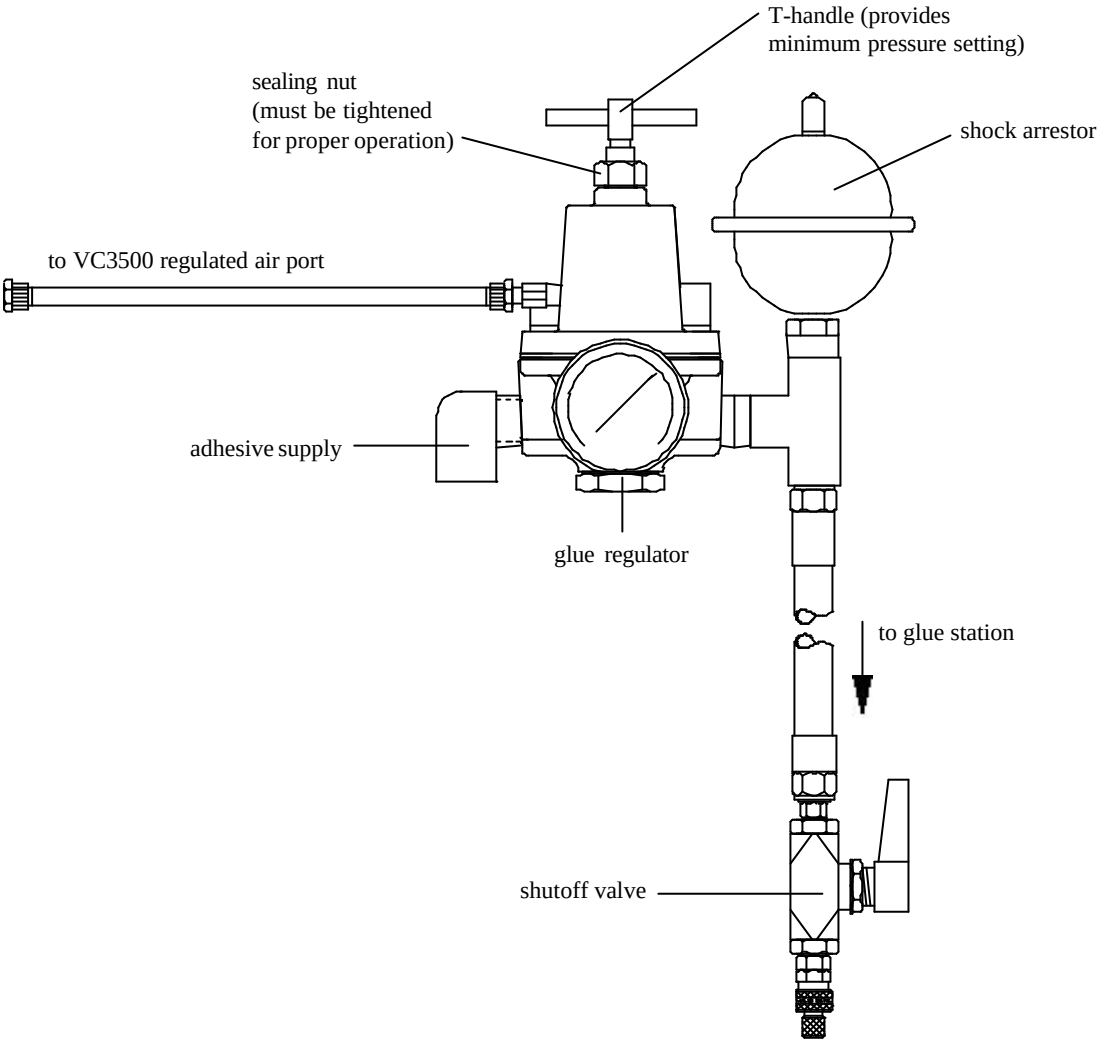


Figure 3. Glue Regulator

Introduction

This section contains both mechanical and electrical installation instructions. Read the “Safety” section in this manual before attempting these procedures.

Electrical installation should be accomplished only by experienced service personnel!

Refer to Figure 8 for detailed layout of internal connections.

Control Installation

Mechanical Installation of Control

The control should be installed on the operator’s side of the parent machine, in a location where vibrations will not occur. The control should require less than 25 feet (8 m) of wiring to reach the glue station, sensor,and shaft encoder (longer wiring is available on request). A 5/16" (8 mm) hex wrench can be used to unlock the door of the control enclosure.

To install the control, follow these steps:

1. Attach the control to a stationary, vertical surface, using the mounting holes located inside the control enclosure (see Figure 6).

Note! The control may also be mounted either to Valco’s machine-mount pedestal or mobile-system pedestal (see Figures 4 and 5).

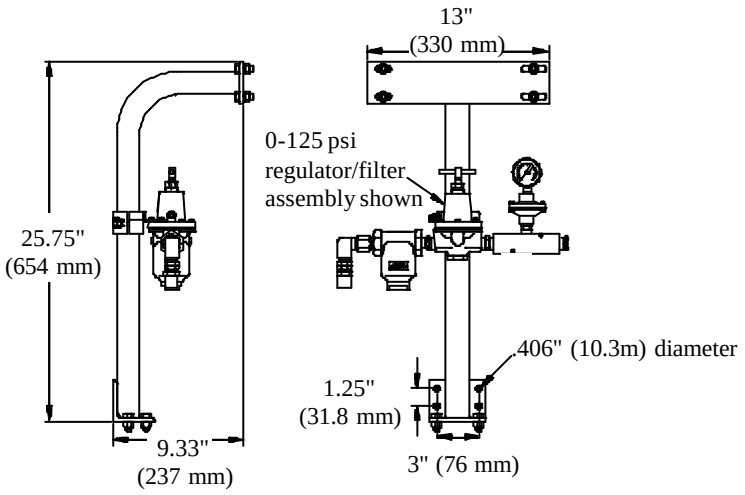


Figure 4. Machine-Mount System Pedestal

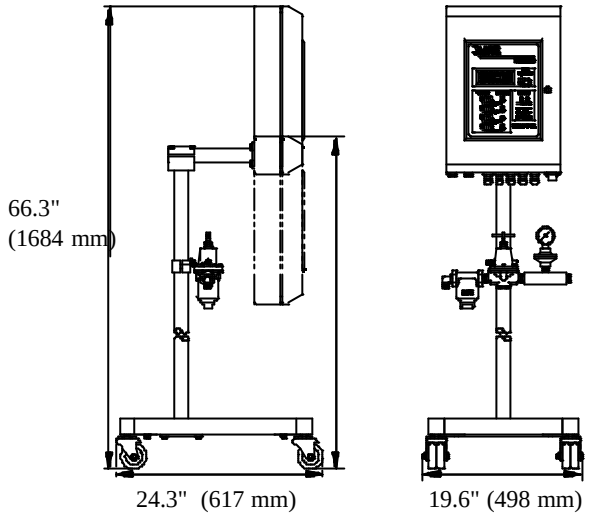


Figure 5. Mobile System Pedestal

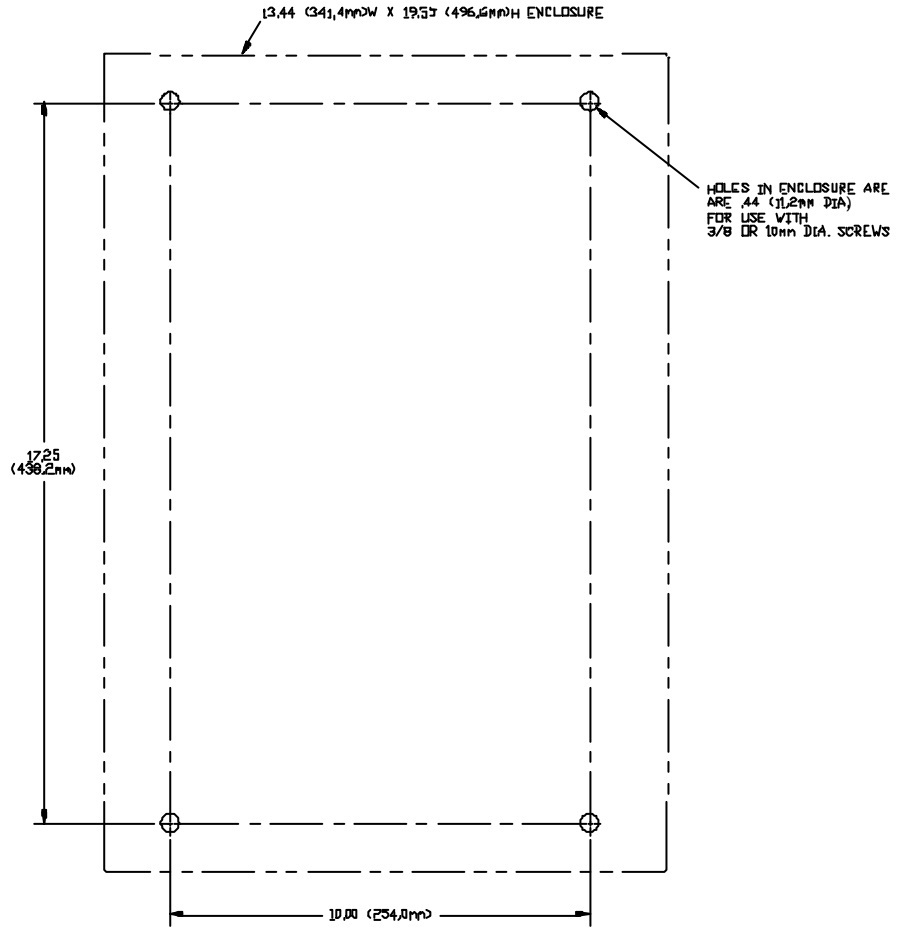


Figure 6. Mounting Hole Dimensions

Electrical Installation of Control

The main's supply must be 115/230 VAC, 50/60 Hz, 2/1 A. The 115/230 power requirement is field-switchable. The power module accepts a standard IEC line cord (supplied).

To connect the line cord, follow these steps:

1. Attach the line cord clamp to the bottom surface of the VC3500, using the two screws on either side of the power module.
2. Insert the line cord into the power module
3. Tighten the line cord clamp to prevent inadvertent loss of power.

Note! The line cord supplied can either be directly wired to a branch circuit or (with the proper plug type) plugged into a 115 or 230 VAC outlet socket. The wire colors of the supplied line cord are as follows:

Wire Type	International Line Cord Color	North American Line Cord Color
Line	Brown	Black
Neutral	Blue	White
Ground	Green/Yellow	Green

Mains Voltage and Fuse Selection

The fuse holder on the bottom panel of the power module contains the fuse drawer, which allows for either 115VAC or 230VAC operation (Figure 7).

To replace or check mains fuses, follow these steps:

1. **Remove all electric power from the unit.**
2. **Remove the line cord.**
3. **Use a small screwdriver to open the hinged door of the fuse holder.**
4. **Remove the fuse drawer (ensure that the fuses in the holder remain in place).**
5. **The drawer is labeled "230V" and "115V." Rotate the drawer to the appropriate voltage.**
6. **For line-to-neutral operation, use the shorting clip (jumper) and one fuse. Shorting clip must be on left side (when rotated to read the correct voltage). For line-to-line operation, use two fuses.**
7. **Replace the drawer in the fuse holder and close the door of the fuse holder.**
8. **The operating voltage shows through the window in the fuse holder door. Ensure that voltage is correct.**

9. Replace the line cord.

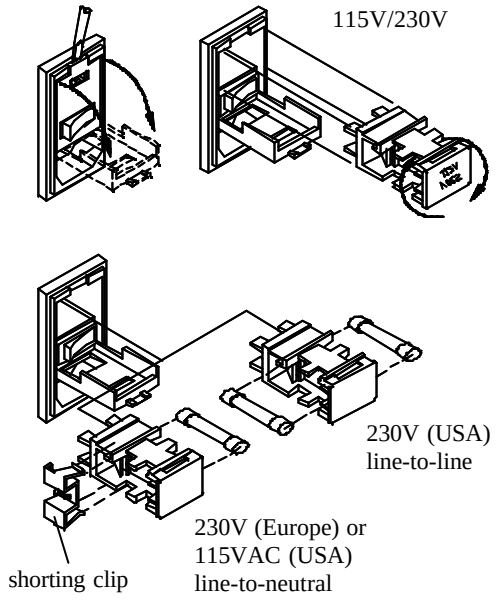


Figure 7. Fuse Drawer

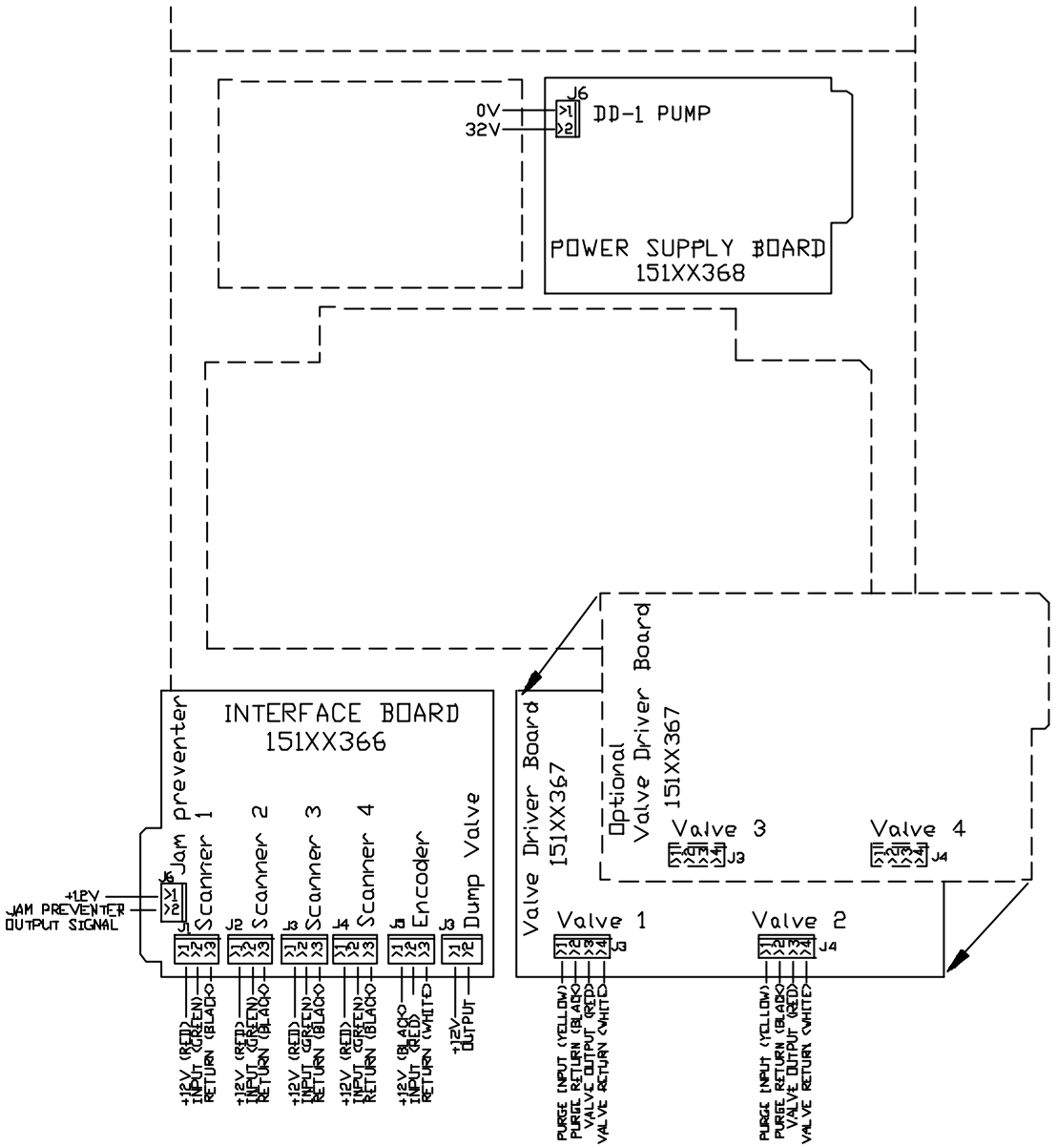


Figure 8. Internal Connections Diagram

Encoder Installation

Mechanical Installation of Encoder

An encoder must be installed in order for the control to determine the speed of the parent machine. For best results, 100 pulses per inch (25.4 mm) of product travel should be supplied to the VC3500. If less than 100 pulses per inch (25.4 mm) are supplied, poor resolution may result in pattern placement errors. If more than 100 pulses per inch (25.4 mm) are supplied, the maximum specified speed of 2000 feet/min (610 m/min) must be reduced.

There are two primary types of encoders:

- Wheel-driven encoder
- Gear-driven encoder

Wheel-Driven Encoder

If using a wheel-driven encoder (Figure 9), a VCE-1000 encoder with a 10-inch measuring wheel is recommended.

To install a wheel-driven encoder, follow these steps:

1. Mount the encoder's bracket to the frame of the parent machine.
2. Ensure that the wheel of the encoder rides securely against the belt and does not slip.
3. In the level-4 menu screen, set ratio compensation to 100 pulses.

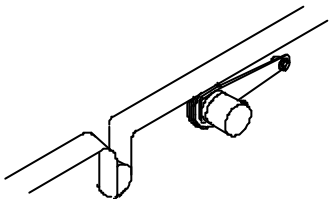


Figure 9. Example of a Wheel-Driven Encoder

Gear-Driven Encoder

The following formula can be used to determine the correct combination of gear teeth and encoder for approximately 100 pulse per inch (25.4 mm):

$$\frac{\text{Teeth-S}}{\text{Teeth-E}} \times \frac{\text{Counts}}{\text{Travel}} = \text{Pulses per inch (25.4 mm) of travel}$$

Teeth-S=Number of teeth on the line-shaft driver gear

Teeth-E=Number of teeth on the encoder driven gear

Counts=Number of encoder pulses per revolution

Travel= Product travel in inches (or millimeters divided by 25.4) per revolution of the drive shaft

Example:

Using a 92-tooth split line shaft gear (driver), a 24-tooth encoder driven gear, a 500-pulse encoder, and 18 inches (or 457 millimeters divided by 25.4) of travel per drive shaft revolution.

$$\frac{92}{24} \times \frac{500}{18} = 106.48$$

Therefore, the ratio compensation setting should be 106.5.

To install a gear-driven encoder (Figure 10), follow these steps:

1. Install the driver gear on the line shaft. Tighten the set-screws.
2. Position and install the encoder so that it is square with the driver gear.
3. Raise or lower the encoder to tighten the belt against the driver gear. (Ensure that the two sides of the belt are not pressed together under the wheel.) Due to the low torque required, the belt should not be extremely tight.

Note! At least 7-9 teeth should engage in the line shaft driver gear. It may be necessary to fabricate an adjustable bracket to connect the encoder base to the parent machine frame.

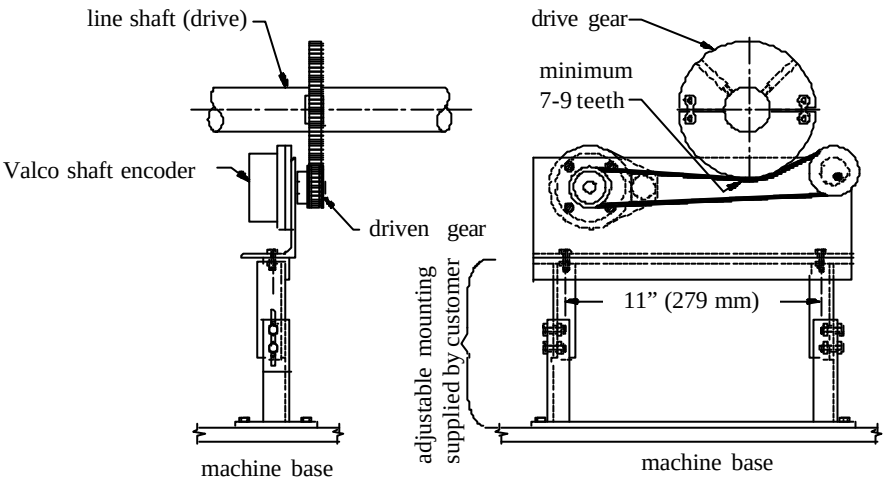


Figure 10. Typical Installation of a Gear-Driven Encoder

Electrical Installation of Encoder

A 12VDC encoder must be used with the VC3500 control. The cable used to connect the encoder to the control should have a minimum of three conductors (18-22 AWG) and a shield.

To connect the encoder to the control, follow these steps:

1. Insert the encoder cable into the control enclosure through a cord grip located on the bottom panel of the control.
2. Connect the encoder to the three-terminal connector (located inside the control) labeled "ENCODER".

Note! Connections are as follows (see Figure 8 for wire colors):

Pin 1: +12VDC—black

Pin 2: Encoder channel signal—red

Pin 3: Return—white

2. Connect the shield wire to the protective earth (P.E.) terminals located near the cord grip base plate.

3. Tighten the cord grip used by the encoder cable.

Note! An optional encoder/scanner A-B switch is available to enable one of two possible encoder/scanner pairs. This switch mounts to the base plate (Figure 11).

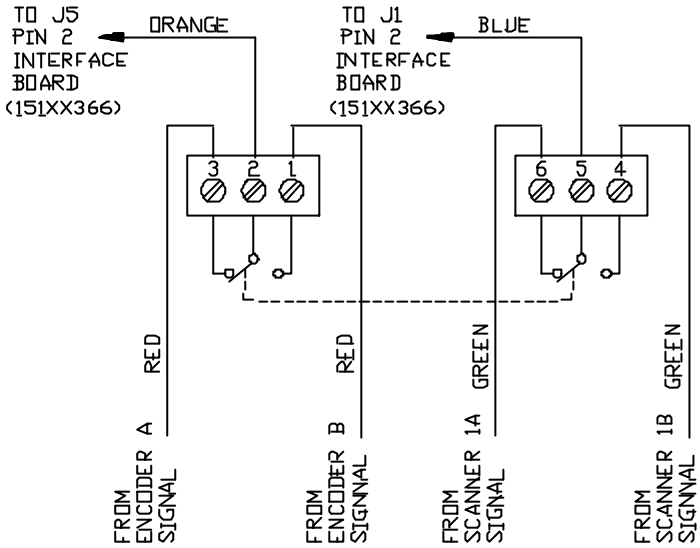


Figure 11. Wiring Diagram for Optional A-B Switch

Scanner Installation

Mechanical Installation of Scanner

At least one product scanner should be installed to detect the leading edge of the product. A single scanner can be used to start the glue patterns of both channel 1 and channel 2 or the channels can have two separate scanners.

To install the scanner, follow these steps:

1. Position the scanner assembly brackets upstream from the glue station (Figures 12 and 13).

2. Set the scanner 1.5 to 2.0 inches (38mm to 51mm) above the product.

Note! The scanner must see through an open area on the parent machine with no obstructions.

Note! The distance between the scanner and the glue valve's nozzle (cell-to-gun distance) cannot exceed the distance from the leading edge of a product to the leading edge of the next product (repeat dimension). The minimum distance allowed between the scanner and the glue valve will be greater at high parent machine speed. The following is a general guide:

Speed	**Minimum Cell-to-Gun Distance**
100 ft/min (30.5 m/min)	1" (25.4 mm)
500 ft/min (152.4 m/min)	2" (51 mm)
1000 ft/min (304.8 m/min)	4" (102 mm)
1500 ft/min (457 m/min)	6" (152 mm)
2000 ft/min (610 m/min)	8" (203 mm)

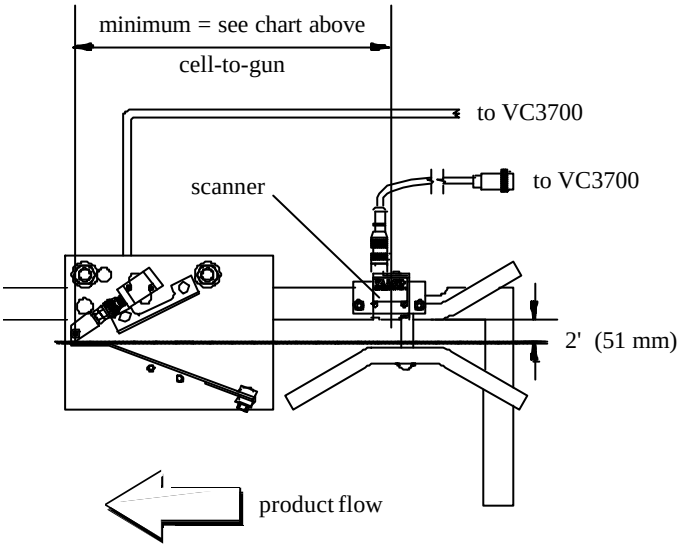


Figure 12. Top-Down Glue Station

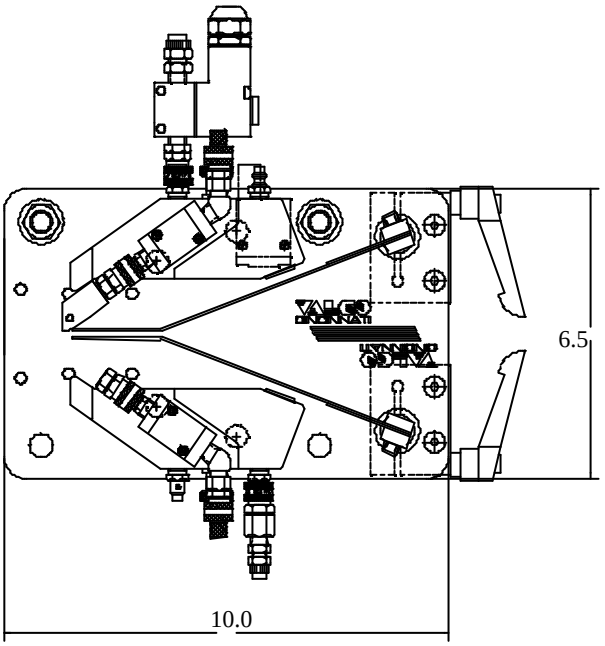


Figure 13. Top-Down, Bottom-Up Combination Glue Station

Electrical Installation of Scanner

The cable used to connect the scanner(s) to the VC3500 control should have a minimum of three conductors (18-22 AWG) and a shield.

To connect the scanner to the control, follow these steps:

1. Insert the scanner cable into the control enclosure through a cord grip located on the bottom panel of the control.
2. Connect the scanner cable to one of the three-terminal connectors labeled "scanner-1", "scanner-2", "scanner 3", or "scanner 4". (A two-channel control only has "scanner 1" and scanner 2".)

Note! On a two-channel control, the "scanner-1" connector must be used for the scanner installed for channel 1. This scanner can also be used to control channel 2. If separate scanners are desired to control channel 1 and channel 2, the "scanner-1" connector must be used for the scanner installed for channel 1, and the "scanner-2" connector must be used for the scanner installed for channel 2.

On a four-channel control, the "scanner-3" connector must be used for the scanner installed for channel 3. This scanner can also be used to control channel 4. If separate scanners are desired to control channel 3 and channel 4, the "scanner-3" connector must be used for the scanner installed for channel 3, and the "scanner-4" connector must be used for the scanner installed for channel 4.

Connections are as follows:

Pin 1: +12VDC—red

Pin 2: Scanner signal—green

Pin 3: Return—black

3. Connect shield wire(s) to the protective earth (P.E.) terminals located near cord-grip base plate.
4. Tighten the cord grip used by the scanner cable(s).

Glue Valve Installation

Electrical Installation of Glue Valve

The glue valve cable should have a minimum of two conductors (18-20 AWG) and a shield (four conductors and a shield if a remote purge is required).

To connect the glue valve to the control, follow these steps:

1. Insert the glue valve cable into the control through a cord grip located on the bottom panel of the control.
2. Connect glue valve cable to the connectors labeled "valve-1" or "valve-2."

Note! On a two-channel control, the "valve-1" connector must be used as the interface point for the glue valve controlled by channel 1. The "valve-2" connector must be used as the interface point for the glue valve controlled by channel 2 (Figure 8).

On a four-channel control, the bottom valve driver board is for channels 1 and 2. The top driver board is for channels 3 and 4.

Connections are as follows:

Pin 1: Purge output—yellow

Pin 2: Purge return—black

Pin 3: Valve output—red

Pin 4: Valve return—white

3. The shield wire should be connected to the protective earth (P.E.) terminals located near the cord grip base plate.
4. Tighten the cord grip used by the valve cable.

Machine-Stop Relay and Beacon Interface

An optional machine stop relay and beacon interface (option D1) is required to indicate a jam condition or glue inspection fault to the parent machine. Normally open and normally closed contacts are provided at a male connector mounted to the cord grip base plate. Contact rating is 24VDC or 60VAC at 2A.

When a jam condition is detected, the machine stop relay is energized. The relay is de-energized when the speed of the parent machine drops below the minimum speed setting (see the level-3 menu screen). The front-panel jam indicator also illuminates.

A field-wireable mating connector (Figure 13a) is provided to wire the relay contacts to the parent machine stop circuit (cable must be supplied by customer). Connections are as follows:

Pins 1 and 2: Normally closed contact

Pins 3 and 4: Normally open contact

An optional beacon with audible alert (Figure 2) can be remotely mounted to indicate a jam condition. A female connector mounted to the cord-grip base plate provides the connection point for beacon/alarm signals. Connections are as follows:

Pin 1: 12VDC

Pin 2: Not used

Pin 3: Jam (red) light

Pin 4: Audible alarm signal

A pre-wired cable is provided with the beacon.

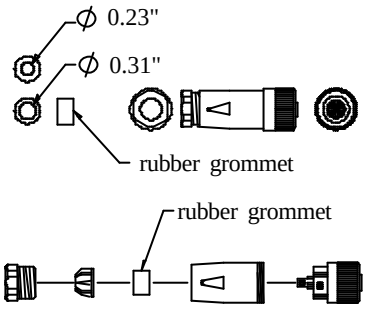


Figure 13a. Field-Wireable Mating Connector

DD-1 Pump Power Supply

A source is available to supply power for a DD-1 pump at connector J6 of the power supply board (151xx368). This supply is 32VDC, fused at 1.6A, with connections as follows:

Pin 1: 0 V

Pin 2: 32VDC

Note! Since the DD-1 pump is configured to accept an AC source and then rectify it to DC, polarity of a DC source is not relevant.

Bypass Valve Driver

A bypass valve (or dump valve) may be needed to divert excess glue in the glue line away from the applicator to avoid puddling during startups and quick stops. A 12VDC, 1A driver is available at connector J8 of the interface board. Connections are as follows:

Pin 1: 12V

Pin 2: Signal

Menus

Introduction

This section contains descriptions of the control's menus, which are displayed on screens. The control's screens are touchscreens, which means that you push the buttons on the actual screen display. ***For specific operating procedures, see the "Operation" section.***

Primary Menus

The VC3500 contains the following primary menu screens (Figure 14):

- ***Main screen***—The main screen is the screen that displays when power is supplied to the control.
- ***Level-1 menu screen***—The level-1 menu screen provides access to the job store screen, the job title screen, the job index screen, the product length screen, and the clear current data screen.
- ***Level-2 menu screen***—The level-2 menu screen provides access to the scan mode screen, the glue mode screen (two-channel model only), and the repeat function.
- ***Level-3 menu screen***—The level-3 menu screen provides access to the clear data screen, the minimum speed screen, and the cell-to-gun screen.
- ***Level-4 menu screen***—The level-4 menu screen provides access to the product length screen, the ratio compensation screen, and the channel compensation screens.
- ***Level-5 menu screen***—The level-5 menu screen provides access to the glue QC screen (two-channel model only), the inch/metric screen, and the PIN code screen.
- ***Level-6 menu screen***—The level-6 menu screen provides access to language selection.

These menu screens and their functions are described in the following paragraphs.

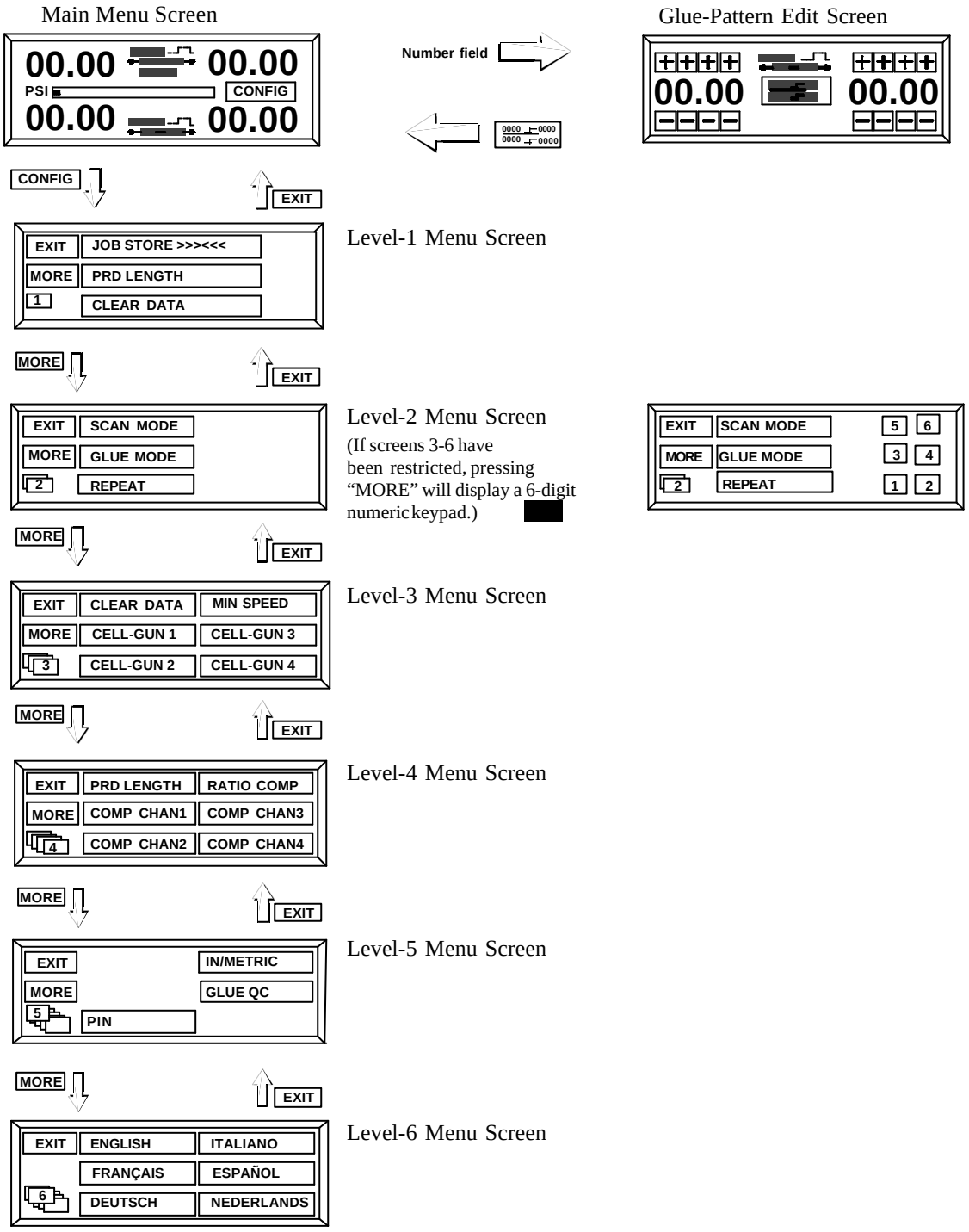


Figure 14. Main Menu Screen, Glue Pattern Edit Screen, and Level-1 through Level-6 Menu Screens

Main Screen

The main screen displays when power is supplied to the control (Figures 15 and 16). The features of the main screen are as follows:

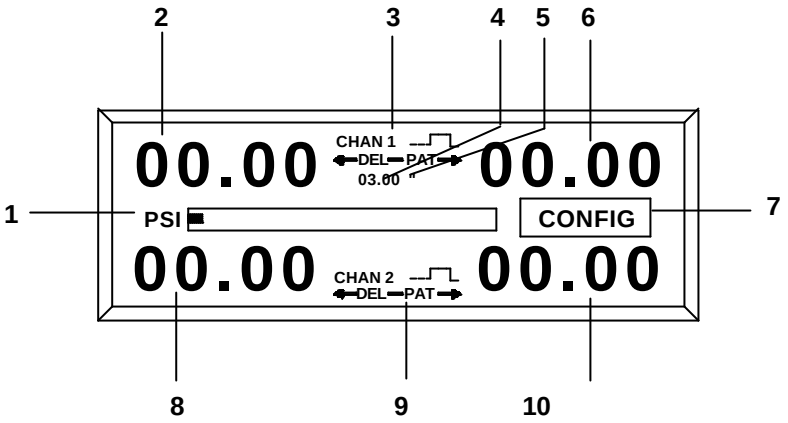


Figure 15. Example of a Two-Channel Control with Glue Mode Set to "Delay Pattern"

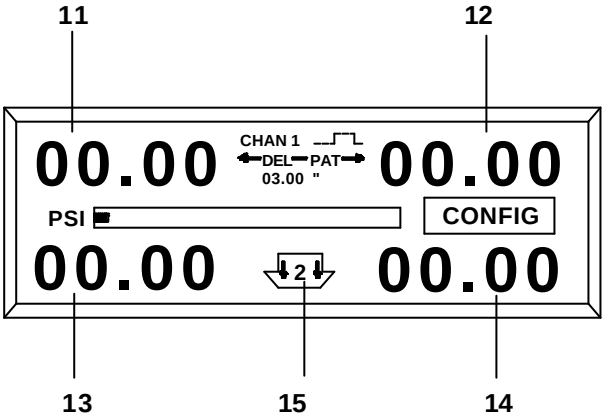


Figure 16. Example of a Two-Channel Control with Glue Mode Set to "Delay Pattern Delay Pattern"

1 Glue pressure bar graph

This field displays the pressure supplied to the glue source. The pressure is displayed in either psi or bar, depending on the setup of the control.

2 Glue pattern delay (channel 1)

This field displays the distance from the leading edge of the product to the beginning of the glue pattern.

3 Channel 1 glue pattern edit

This field displays the channel assignment for the delay and pattern length settings seen on the left and right of this display.

4 Software version

This field displays the software version used by the control.

5 **Inch or mm indicator**

This field displays the measurement setup for the control. The inch symbol (") indicates imperial measurements and "mm" indicates metric measurements.

6 **Glue pattern length (channel 1)**

This field displays the length of the glue pattern.

7 **Configuration**

The level-1 menu screen displays when this button is pressed.

8 **Glue pattern delay (channel 2)**

This field displays the distance from the leading edge of the product to the beginning of the glue pattern.

9 **Channel 2 glue pattern edit**

This field displays the channel assignment for the delay and pattern length settings seen on the left and right of this display

10 **Glue pattern length (channel 2)**

This field displays the distance of the glue pattern.

Note! Items 11-15 pertain to the "delay pattern delay pattern" glue mode.

11 **First glue pattern delay**

This field displays the distance from leading edge of product to beginning of first glue pattern.

Note! A minimum of 00.01 inches (0001 mm) must be entered for the delay setting to activate the channel.

12 **First glue pattern length**

This field displays the distance of the glue pattern.

13 **Second glue pattern delay**

This field displays the distance from end of first glue pattern to beginning of second glue pattern.

14 **Second glue pattern length**

This field displays the distance of the second glue pattern.

15 **Page down**

Pressing this button displays pattern information for the next channel.

Glue-Pattern Edit Screen

The glue-pattern edit screen (Figure 18) displays when any of the numbers on the main screen are pressed. The function of each button is as follows:

"+"—This button increases values for the pattern delay and length.

"-"—This button decreasse values for the pattern delay and length.

Symbol in center of the screen—This button returns you to the main screen.

Note! The main screen will appear automatically if the parameters in the glue pattern edit screen have not been changed for ten seconds.

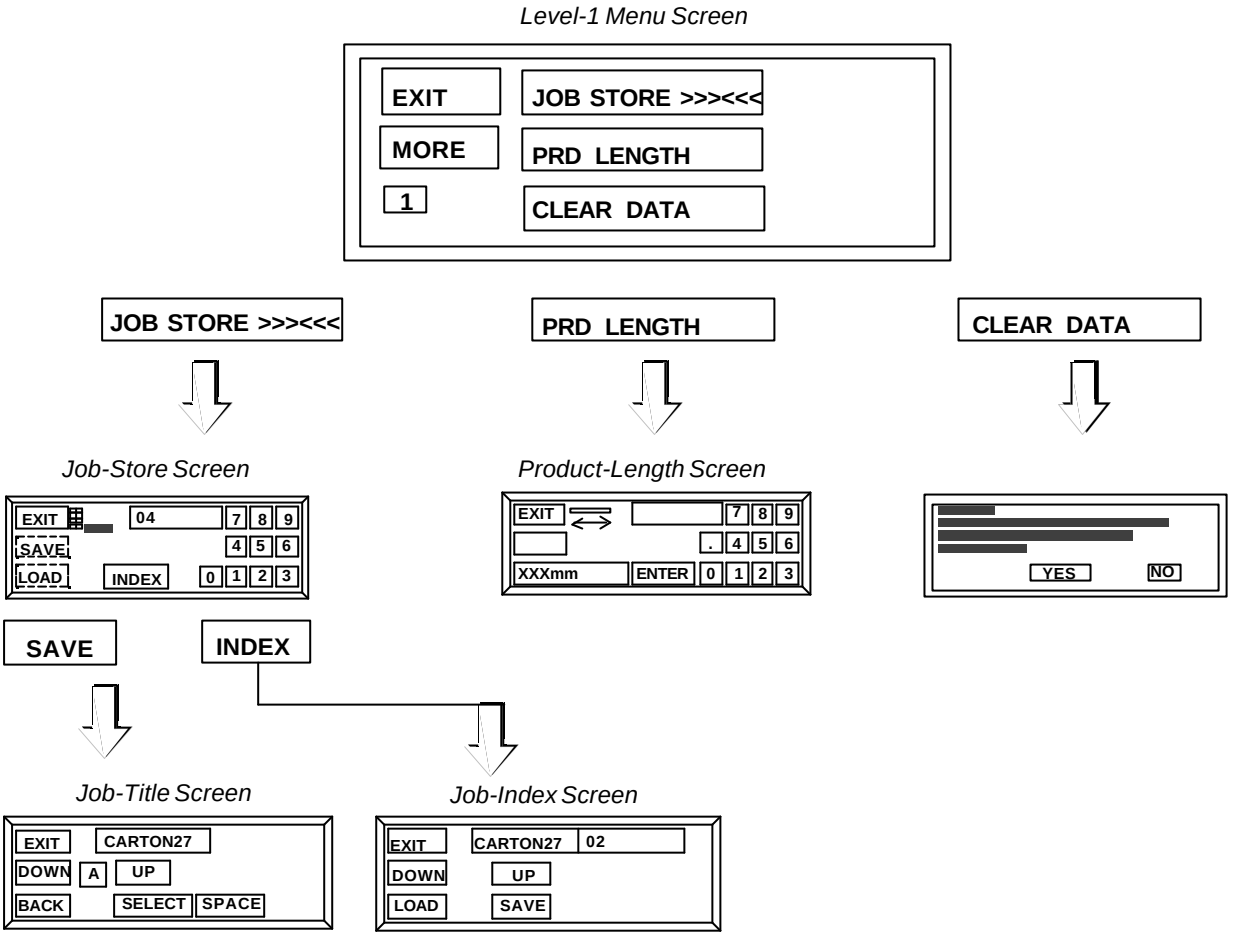


Figure 17. Level-1 Menu Screen and Associated Screens

Level-1 Menu Screen

The level-1 menu screen (Figure 17) displays when the "CONFIG" button on the main screen is pressed. The small box with the numeral "1" indicates the level-1 menu screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the main screen.

MORE—Pressing this button displays the level-2 menu screen.

JOB STORE—Pressing this button displays the job store screen. The job store screen allows you to create a job name, save a job, and load a job.

PRD LENGTH—Pressing this button displays the product-length screen. The control uses the product-length value when calculating the ratio compensation in the automatic mode, detecting a product jam condition, and enabling the scanner lockout function to ignore holes in the product or dark areas such as printing.

CLEAR DATA—Pressing this button displays the clear-data screen. Pressing the "YES" button in the clear data screen erases the current job's delay and glue pattern length settings and returns the product length setting to zero. Pressing the "NO" button in the clear data screen returns you to the level-1 menu screen without erasing any data.

The Job Store Screen

The job store screen (Figure 17) displays when the "JOB STORE" button is pressed on the level-1 menu screen. The job store screen is used to assign job numbers. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-1 menu screen.

Numeric Keypad—You use the numeric keypad on the screen to enter a two-digit job number (all job parameters of the active job are saved when the job number is entered).

INDEX—Pressing this button displays the job index screen, which lists job names and numbers.

LOAD—This button displays only after the two-digit job number has been entered. Pressing the "LOAD" button loads the job.

SAVE—This button displays only after the two-digit job number has been entered. Pressing this button displays the job title screen, which allows you to assign a job name to the two-digit job number.

The Job Title Screen

The job title screen (Figure 17) displays when the "SAVE" button is pressed on the job store screen. The job title screen is used to assign a name (up to 10 characters) to the two-digit job number. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-1 menu screen.

A—This field displays the alphabet, numbers, and special characters.

DOWN—This button is used to scroll down through the alphabet, numbers, and special characters.

UP—This button is used to scroll up through the alphabet, numbers, and special characters.

BACK—Pressing this button moves the cursor backward in the job name field, erasing the displayed letters as it moves.

SELECT—Pressing this button enters the displayed letter into the job name field.

SPACE—Pressing this button adds a space to the job name.

The Job Index Screen

The job index screen (Figure 17) displays when the "INDEX" button is pressed on the job store screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the job store screen.

DOWN—Pressing this button allows you to scroll down the list of job names and numbers. ("01" is the lowest job number possible.)

UP—Pressing this button allows you to scroll up the list of job names and numbers. ("99" is the highest job number possible.)

LOAD—Pressing this button loads the job shown in the job name/number display.

SAVE—Pressing this button saves the active job to the name and number seen in the job name/number display (located above the "UP" button).

The Product Length Screen

The product-length screen (Figure 17) is used to specify product length. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-1 menu screen.

Numeric Keypad—The numeric keypad is used to type a product length.

ENTER—Pressing this button enters the product length.

The Clear-Data Screen

The clear-data screen (Figure 17) is used to clear the current job's data. The function of each button is as follows:

YES—Pressing the "YES" button erases the current job's delay and glue patterns.

NO—Pressing the "NO" button returns you to the level-1 menu screen without erasing any data.

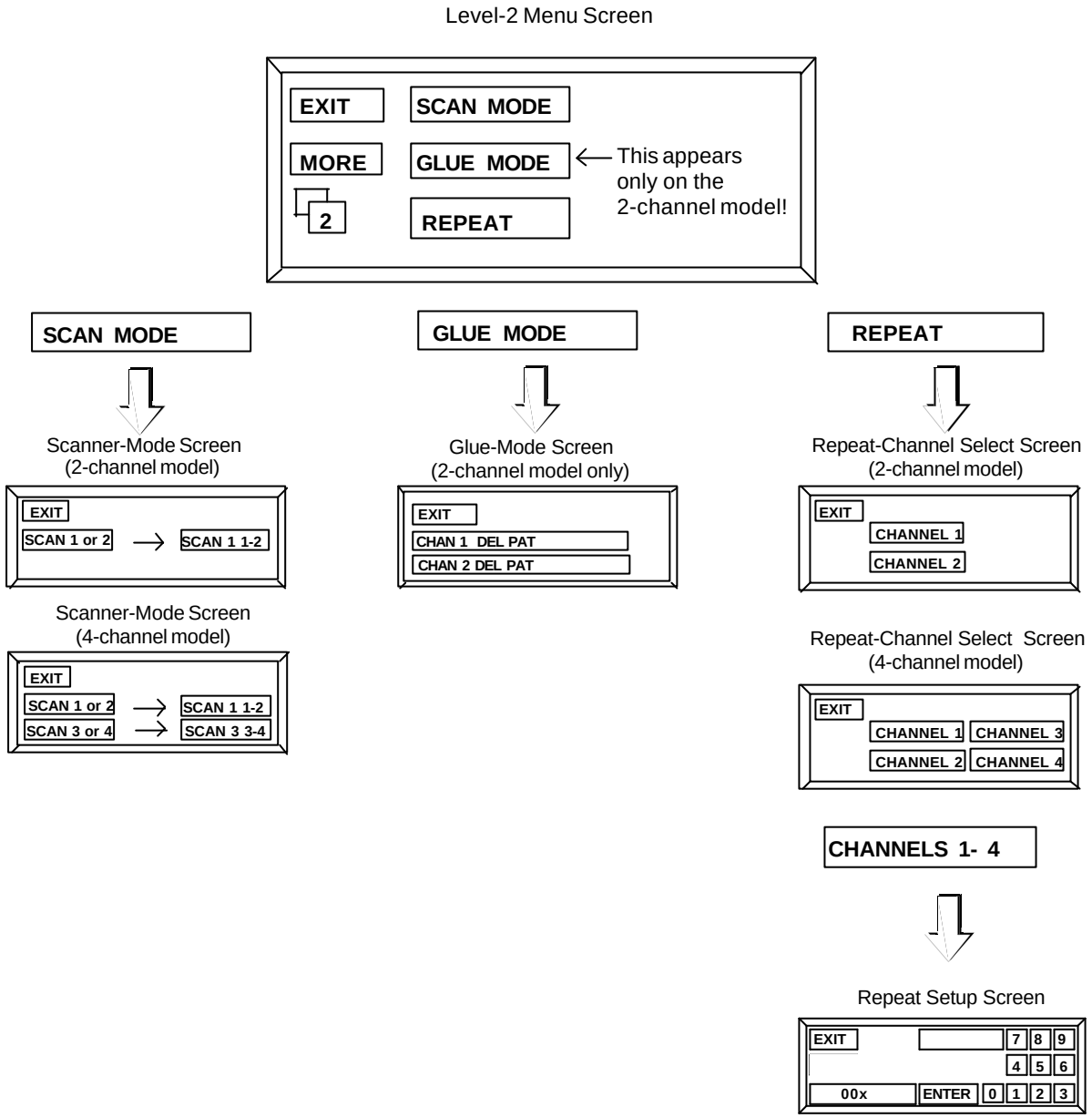


Figure 18. Level-2 Menu Screen and Associated Screens

Level-2 Menu Screen

The level-2 menu screen (Figure 18) displays when the "MORE" button on the level-1 menu screen is pressed. The small box with the numeral 2 indicates the level-2 menu screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-1 menu screen.

MORE—Pressing this button advances you to the level-3 menu screen.

SCAN MODE—Pressing this button displays the scanner mode screen.

GLUE MODE (this appears only on the 2-channel model)—Pressing this button displays the glue mode screen.

REPEAT—Pressing this button displays the repeat-function screen.

The Scan-Mode Screen

The scan-mode screen (Figure 18) is used to select a scanner mode. The function of each button is:

EXIT—Pressing this button returns you to the level-2 menu screen.

SCAN 1 or 2—Pressing this button selects use of independent scanners for channels 1 and 2.

SCAN 1 1-2—Pressing this button selects use of a common scanner (scanner 1) for channels 1 and 2.

The Glue-Mode Screen

The glue-mode screen (Figure 18) is used to select a glue mode. The function of each button is:

EXIT—Pressing this button returns you to the level-2 menu screen.

CHAN 1 DEL PAT—Pressing this button selects either a single delay pattern (DEL PAT) or a dual delay pattern (DEL PAT DEL PAT) for channel 1.

CHAN 2 DEL PAT—Pressing this button selects either a single delay pattern (DEL PAT) or a dual delay pattern (DEL PAT DEL PAT) for channel 2.

The Repeat-Channel Select Screen

The repeat-channel select screen (Figure 18) is used to select the repeat-setup screen for channel 1 and/or channel 2. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-2 menu screen.

CHANNEL 1—Pressing this button displays the repeat-setup screen for channel 1.

CHANNEL 2—Pressing this button displays the repeat-setup screen for channel 2.

The Repeat-Setup Screen

The repeat-setup screen (Figure 18) is used to program the repeat function. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-2 menu screen.

Numeric Keypad—The numeric keypad is used to specify the number of repetitions.

ENTER—Pressing this button enters the number of repetitions.

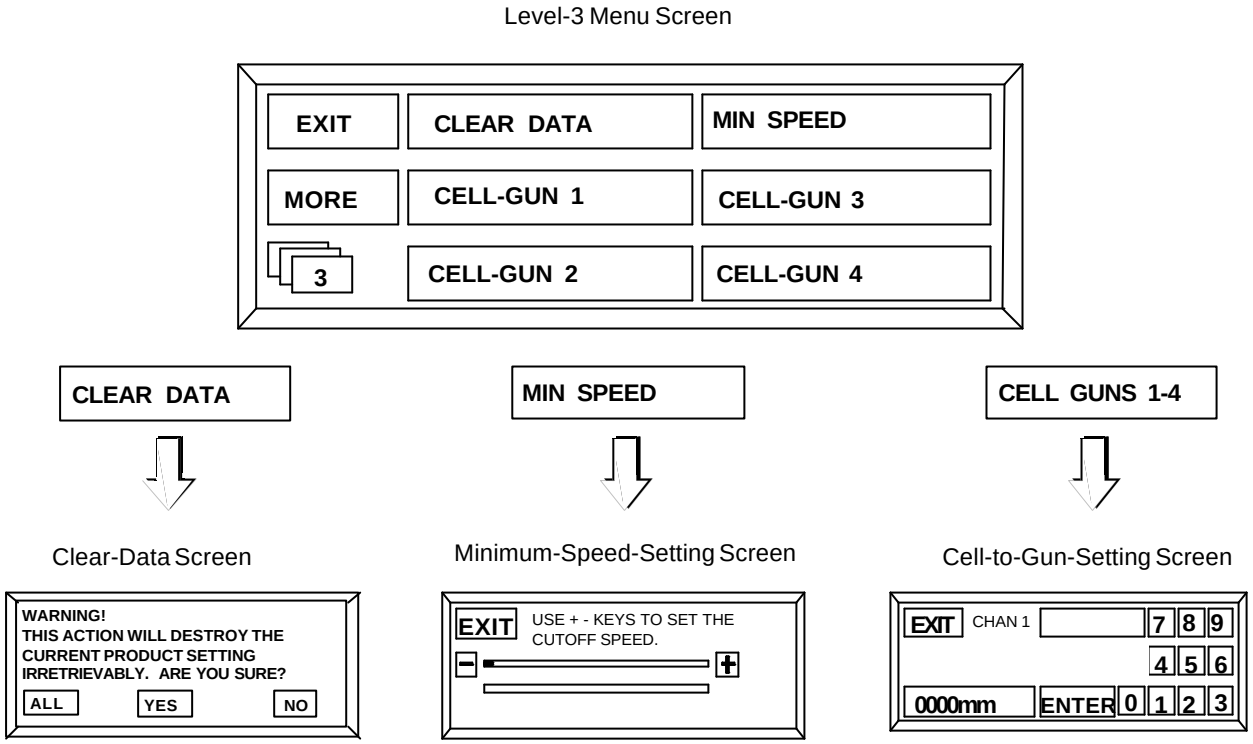


Figure 19. Level-3 Menu Screens and Related Screens

Level-3 Menu Screen

The level-3 menu screen displays when the "MORE" button on the level-2 menu screen is pressed (Figure 19). The small box with the numeral 3 indicates that this is the level-3 menu screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-2 menu screen.

MORE—Pressing this button advances you to the level-4 menu screen.

CLEAR DATA—Pressing this button displays the clear-data screen, which allows you to erase either the current job's data or all data.

MIN SPEED—Pressing this button displays the minimum-speed-setting screen, which allows you to specify the minimum gluing speed.

CELL-GUN (1-4)—Pressing any of the CELL-GUN buttons displays the cell-to-gun-setting screen, which allows you to specify cell-to-gun dimensions.

The Clear-Data Screen

The clear-data screen is used to clear either all or partial data. The function of each button is as follows:

ALL—Pressing this button resets all parameters.

YES—Pressing this button erases the current job's delay and glue patterns.

NO—Pressing this button returns you to the level-3 menu screen without erasing any data.

The Minimum-Speed-Setting Screen

The minimum-speed-setting screen is used to specify the minimum gluing speed. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-3 menu screen.

The "-" key—Pressing the "-" key reduces the minimum speed.

The "+" key—Pressing the "+" key increases the minimum speed.

The Cell-to-Gun-Setting Screen

EXIT—Pressing this button returns you to the level-3 menu screen.

The numeric keyboard—The numeric keyboard is used to specify the distance between the channel scanner and the channel glue valve.

ENTER—Pressing this key enters the distance between the channel scanner and the channel glue valve.

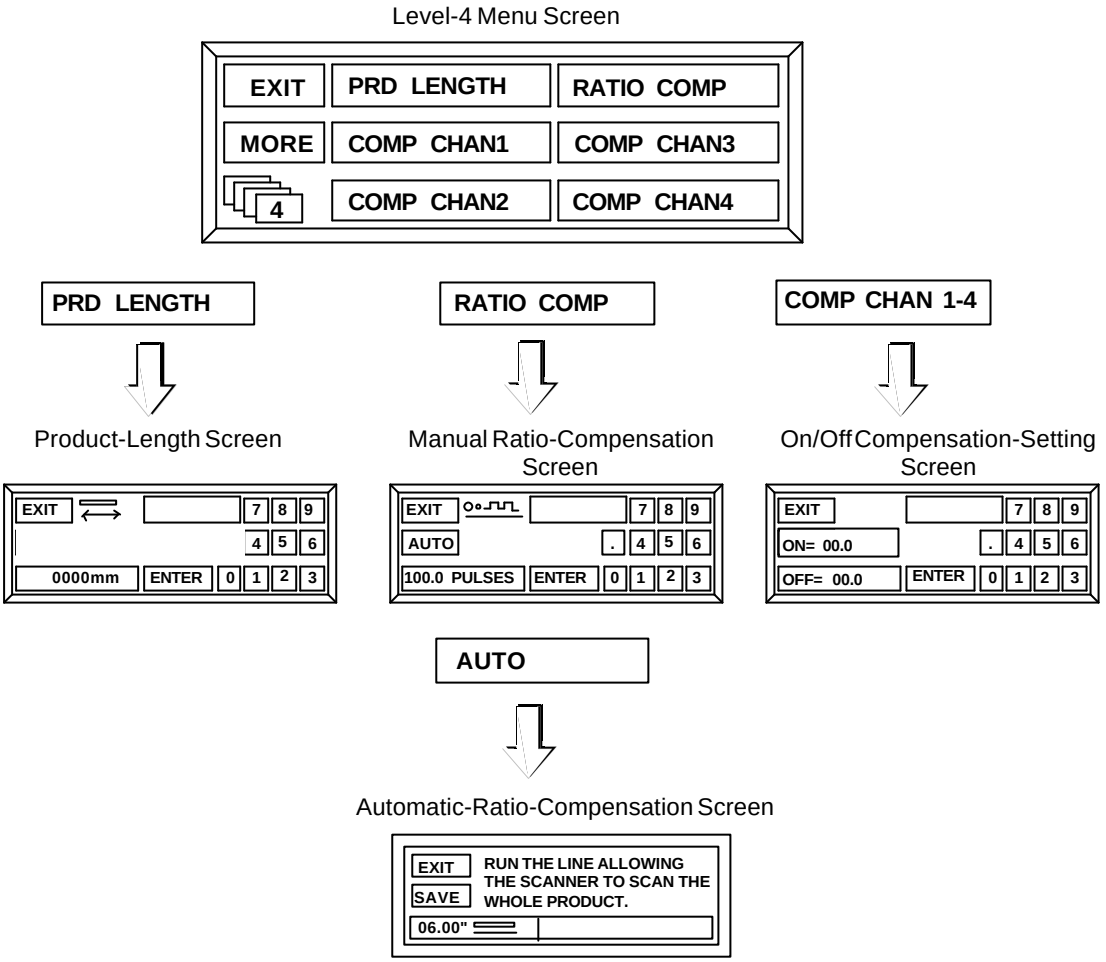


Figure 20. Level-4 Menu Screen and Associated Screens

Level-4 Menu Screen

The level-4 menu screen (Figure 20) displays when the "MORE" button on the level-3 menu screen is pressed. The small box with the numeral 4 indicates that this is the level-4 menu screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-3 menu screen.

MORE—Pressing this button advances you to the level-5 menu screen.

PRD LENGTH— The control uses the product length value when calculating the ratio compensation in the auto mode, detecting a product jam condition and enabling the scanner lockout function to ignore holes in the product or dark areas such as printing. Pressing this button displays the product length screen.

RATIO COMP—Pressing this button displays the ratio compensation screen. Either a manual or automatic ratio compensation method may be used.

COMP CHAN (1-4)—Each channel (valve) has a separate compensation setting (COMP CHAN1, COMP CHAN2, etc.). Pressing any of the COMP CHAN buttons displays the compensation setting screen for that channel.

The Product-Length Screen

The product-length screen is used to specify product length. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-4 menu screen.

Numeric Keypad—The numeric keypad is used to specify the product length.

ENTER—Pressing this button enters the product length.

The Manual-Ratio-Compensation Screen

The manual-ratio-compensation screen is used to specify the product length. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-4 menu screen.

Numeric keypad—The numeric keypad is used to specify the number of encoder pulses per inch (25.4) mm) of product line travel.

ENTER—Pressing this button enters the number of encoder pulses per inch (25.4) mm) of product line travel.

AUTO—Pressing this button displays the automatic ratio compensation screen.

The Automatic-Ratio-Compensation Screen

The automatic-ratio-compensation screen displays when the "AUTO" button on the ratio-compensation screen is pressed. The automatic-ratio-compensation screen is used to specify the number of encoder pulses per inch (25.4 mm) of product line travel. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-4 menu screen.

SAVE—Pressing this button saves the new ratio compensation that is displayed at the bottom of the screen.

The On/Off-Compensation-Setting Screen

The on/off-compensation-setting screen displays when any of the "COMP CHAN" buttons on the level-4 menu screen are pressed. The compensation-setting screen is used to specify the turn-on and turn-off times for the valves that are driven by each channel. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-4 menu screen.

ON=—Pressing this button allows the turn-on time to be specified.

OFF=—Pressing this button allows the turn-off time to be specified.

Numeric keypad—The numeric keypad is used to specify the turn-on/turn-off time for the channel that you have selected.

ENTER—Pressing this button enters the turn-on/turn-off time.

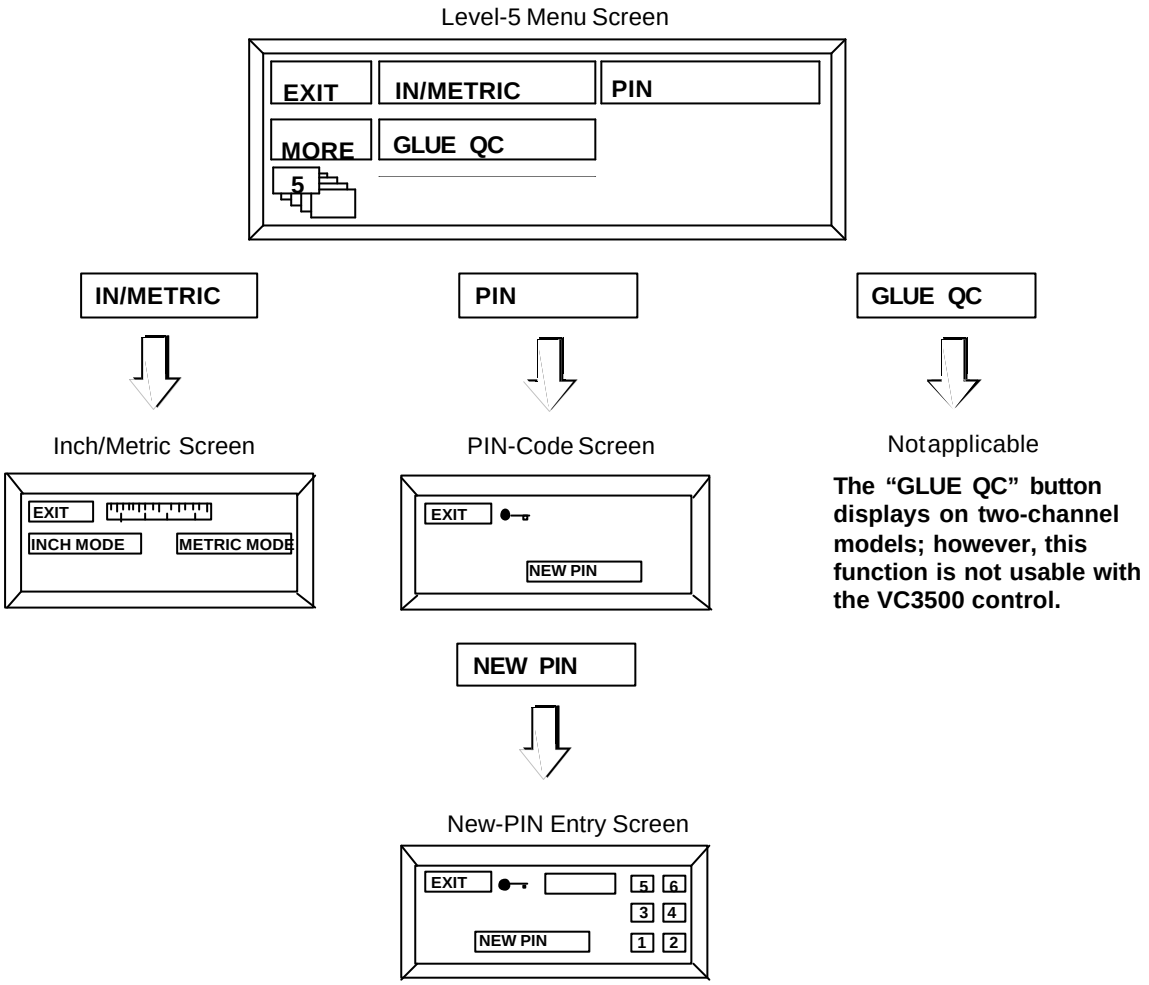


Figure 21. Level-5 Menu Screen and Associated Screens

Level-5 Menu Screen

The level-5 menu screen (Figure 21) displays when the word "MORE" on the level-4 menu screen is pressed. The small box with the numeral 5 indicates that this is the level-5 menu screen. The funtion of each button is as follows:

EXIT—Pressing this button returns you to the level-4 menu screen.

MORE—Pressing this button advances you to the level-6 menu screen.

IN/METRIC—Pressing this button displays the inch/metric screen. When the "inch mode" is selected, all linear measurements are displayed and entered in inches, and pressure is displayed in pounds per square inch (psi). When the "metric mode" is selected, all linear measurements are displayed and entered in millimeters, and pressure is displayed in "bar."

PIN—Pressing the "PIN" button displays the PIN-code screen.A four-digit PIN code may be entered in order to restrict access to menus 3-6.

GLUE QC—This button displays on two-channel models, ***but it does not have a function***.

The Inch/Metric Screen

The inch/metric screen (Figure 21) is used to specify either inches or millimeters. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-5 menu screen.

INCH MODE—Pressing this button sets the control to imperial (inch and psi) measurements.

METRIC MODE—Pressing this button sets the control to metric (mm and bar) measurements.

The PIN-Code Screen

The PIN-code screen (Figure 21) is used to specify a PIN code in order to restrict screens 3-6. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-5 menu screen.

NEW PIN—Pressing this button displays a 6-digit numeric keypad, which you use to enter a new 4-digit PIN code.

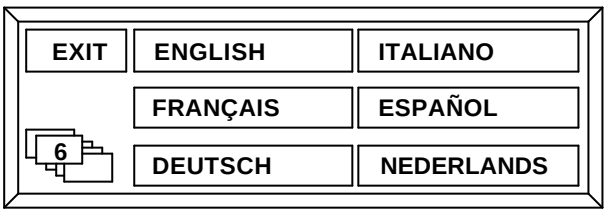


Figure 22. The Level-6 Menu Screen

Level-6 Menu Screen

The level-6 menu screen (Figure 22) displays when the "MORE" button on the level-5 menu screen is pressed The small box with the numeral 6 indicates that this is the level-6 menu screen. The function of each button is as follows:

Language buttons—Pressing one of the language buttons causes that language to display on all of the screens.

EXIT—Pressing the "EXIT" button returns you to the level-5 menu screen.

Initial Setup

Introduction

This section contains procedures for initial setup of the control. It may be helpful to refer to the flowcharts provided in the "Menus" section of this manual. The flowcharts are located as follows:

- Primary menu screens—Figure 14 (page 26)
- Level-1 menu screens—Figure 17 (page 29)
- Level-2 menu screens—Figure 18 (page 32)
- Level-3 menu screens—Figure 19 (page 34)
- Level-4 menu screens—Figure 20 (page 36)
- Level-5 menu screens—Figure 21 (page 38)

Initial Setup

To conduct initial setup of the control, complete each of the following procedures.

Disable Glue Valves for All Channels

To disable glue valves for all channels, follow these steps:

1. Place channel toggle switches in center position ("0") to prevent gluing during setup procedure.

Specify Inches or Millimeters

To specify inches or millimeters, follow these steps:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "MORE" button in the level-1 menu screen.
3. Press the MORE button in menu screens 2, 3 and 4. The level-5 menu screen displays.
4. Press the "IN/METRIC" button. The inch/metric screen displays.
5. Press either the "INCH MODE" button or the "METRIC MODE" button. (The arrow points toward the mode that you have selected).

Note! When the "inch mode" is selected, all linear measurements are displayed and entered in inches, using four digits—two of which are decimal places (example: 10.00 = 10 inches). Pressure is displayed in pounds per square inch (psi). When the "metric mode" is selected, all linear measurements are displayed and entered in millimeters, using four digits
(example: 1000 = 1000 millimeters). Pressure is displayed in bar.

Note! Small errors (0.04 inch or 1mm) will result in parameters when switching between inch and metric modes.

6. Press the "EXIT" button to return to the level-5 menu screen.

Specify Minimum Gluing Speed

To specify the minimum gluing speed, follow these steps:

1. Begin operating the production line at the desired minimum speed (the speed at which gluing will begin).
2. Press the "MIN SPEED" button in the level-3 menu screen.

Note! The minimum speed setting screen displays two bar graphs. The top bar graph displays the minimum speed of the parent machine at which gluing will begin. The bottom bar graph displays the actual speed of the parent machine. The maximum speed indication of the bar graph is 1000 feet (300 meters) per minute. If the parent machine exceeds this speed, the bar graph restarts from the left side and displays the speed above 1000 feet (300 meters) per minute.

3. Use the plus or minus buttons on the screen to adjust the upper bar graph (minimum speed) so that it is less than the lower bar graph (actual machine speed).
4. Press the "EXIT" button when done.

Set Cell-to-Gun Dimensions

To set the cell-to-gun dimensions, follow these steps:

1. Press the "CELL-GUN 1" button in the level-3 menu screen. The cell-to-gun setting screen displays.
2. Using the numeric keypad, enter the distance between the channel 1 scanner and the channel 1 glue valve (this value will display in either inches or millimeters depending on the setup of your control).

Note! Each channel (valve) has a separate cell-to-gun setting ("CELL-GUN 1" and "CELL-GUN 2").

3. Press the "ENTER" button. The "OK DONE" message displays, indicating that the distance entered has been saved.

Note! This value should need no adjustment after the initial installation of the control and valves. However, the setting should be checked if the valves or scanners are moved or changed.

4. Press the "EXIT" button to return to the level-3 menu screen.

Note! To set additional cell-to-gun dimensions, you repeat steps 4a. through 4d.

Specify Ratio Compensation

To specify ratio compensation, follow these steps:

1. Press the "RATIO COMP" button in the level-4 menu screen.
2. Set the ratio compensation either manually or automatically (see procedures below).

Manual Ratio Compensation

To set ratio compensation manually, follow these steps:

1. Press the "RATIO COMP" button in the level-4 menu screen. The ratio compensation screen displays.
2. Using the numeric keyboard, input the number of encoder pulses per inch (25.4 mm) of product line travel.
3. Press the "ENTER" button. (The "OK DONE" message displays.)

Automatic Ratio Compensation

To set ratio compensation automatically, follow these steps:

1. Press the "PRD LENGTH" button in the level-4 menu screen. The product length screen displays.

Note! If using jam prevention, you must disable the stop circuit before using automatic ratio compensation. Otherwise, machine will shut down.

2. Using the numeric keypad, enter the exact product length.
3. Press the "ENTER" button. (The "OK DONE" message displays.)
4. Press the "EXIT" button to return to the level-4 menu screen
5. Press the "RATIO COMP" button in the level-4 menu screen. The ratio compensation screen displays.
6. Press the "AUTO" button. The automatic ratio compensation screen displays.
7. Run the line, allowing scanner 1 to scan the whole product.

Note! After the control has determined the number of encoder pulses per inch (25.4 mm) of product line travel, the value will be displayed in the automatic ratio compensation screen. Product length is seen on the left side of the screen and encoder pulses per inch (25.4 mm) of product travel are seen on the right side of the screen.

8. Press the "SAVE" button to accept the new ratio compensation setting.

Note! Automatic ratio compensation is used to determine a general ratio compensation to a resolution of several pulses.

9. Ensure that ratio compensation is accurate by measuring the length of a glue bead dispensed at low speed.
10. If necessary, use the manual ratio compensation to fine-tune the ratio compensation to a resolution of 0.1 pulse.
11. After the ratio compensation has been established, add 2 inches (50 mm) to the product length setting in order to allow the jam preventer and scanner lockout functions to operate correctly.

Specify On and Off Compensation

To specify on and off compensation, follow these steps:

1. The channel compensation allows a turn-on and turn-off time to be entered for each glue valve. Press the "COMP CHAN1" button in the level-4 menu screen. The compensation setting screen displays.
2. Press the "ON" button.
3. Enter the manufacturer-specified "ON" compensation (turn-on time) in milliseconds for the channel 1 glue valve.

Note! If compensation value is not known, follow the "Unknown Compensation Value" procedure on the following page.

4. Press the "ENTER" button. (The turn-on time displays in the "ON=" window.)
5. Press the "OFF" button.
6. Enter the manufacturer-specified "OFF" compensation (turn-off time) in milliseconds for the channel 1 glue valve.
7. Press the "ENTER" button. (The turn-off time displays in the "OFF=" window.)

Note! To set compensation times for the other channels, you press the appropriate "COMP CHAN2" button and enter the turn-on and turn-off times as described above.

8. Press the "EXIT" button to return to the level-4 menu screen.

Unknown Compensation Value

When the compensation value is not known, follow these steps:

1. At the level-4 menu screen, set the channel's on and off compensation to 0 (see the "Initial Setup" section).
2. Adjust the cell-to-gun dimension for the channel until the leading edge of the pattern is correct at low speed—that is, less than 75 feet (25m) per minute.
3. Increase machine speed to maximum.
4. Adjust the "ON" compensation until the leading edge of the pattern is correct. (Increasing the ON compensation will move the leading edge of the pattern forward at high speeds.)
5. Adjust the "OFF" compensation until the trailing edge of the pattern is correct. (Increasing the "OFF" compensation will move the trailing edge of the pattern forward at high speeds.)

Note! Do not leave "0" on the "Off" compensation setting while having a number higher than "0" on the "On" compensation setting. This will cause the training edge of the pattern to increase in length.

Restrict Screen Access

To restrict access to screens 3–6, follow these steps:

1. In the level-5 menu screen, press the "PIN" button. The PIN-code screen displays.
2. Press the "NEW PIN" button. (A six-digit numeric keypad and a display window appear.)

Note! If a PIN code has been previously entered, the new PIN code will overwrite the old PIN code—only one PIN code is possible.

3. Enter a four-digit PIN code.

Note! Screens 3–6 are now restricted. From now on, the six-digit numeric keypad will display when the "MORE" button is pressed in the level-2 menu screen. To proceed to additional menu levels (3-6), a user must enter the four-digit PIN code.

To provide non-restricted screen access, follow this step:

1. Press the "NEW PIN" button twice in order to delete the PIN code.

Return to the Main Screen

To return to the main menu screen, follow this step:

1. Press the "EXIT" button in the level-4, level-3, level-2, and level-1 menu screens.

Operation

Introduction

This section contains procedures for operating the control. It may be helpful to refer to the flowcharts provided in the "Menus" section of this manual. The flowcharts are located as follows:

- Primary menu screens—Figure 14 (page 26)
- Level-1 menu screens—Figure 17 (page 29)
- Level-2 menu screens—Figure 18 (page 32)
- Level-3 menu screens—Figure 19 (page 34)
- Level-4 menu screens—Figure 20 (page 36)
- Level-5 menu screens—Figure 21 (page 38)

Creating a Job

To create a job, follow these steps:

1. Specify the scanner mode (see Page 53).
2. Specify the glue mode (see Page 54).

Note! If the repeat function will be used, see Appendix A.

3. Specify the delay and pattern values (see Page 54).
4. Specify product length (see Page 55).
5. Enable the glue valves:

   5a. Place the toggle switches for the desired channels in the enabled position ("|").

6. Conduct a low-speed check:

   6a. Operate the parent machine at low speed.

   6b. Observe the glue pattern on the product.

   Note! Gluing does not begin until the parent machine is operating at the minimum threshold speed set in the control. It may be necessary to adjust the minimum speed to apply glue at low speed.

   6c. Adjust the values for delay and pattern if necessary.

7. Conduct a high-speed check:

   7a. Operate the parent machine at the maximum production speed.

   7b. Observe the glue pattern on the product. If the glue pattern is not accurately applied at high speed, follow the channel compensation procedure in the "Initial Setup" section.

8. Adjust the glue pressure:

   8a. Use the front-panel glue pressure switch to increase ("+") or decrease ("-") the pattern's glue volume (air pressure) if necessary.

   Note! The amount of pressure selected is indicated by the linear bar graph in the center of the screen and by a pressure gauge located underneath the control.

Saving a Job

To save a job for future recall, follow these steps:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "JOB STORE" button. (The job-store screen displays.)
3. Perform one of the following actions (3a or 3b):

   3a. Enter a two-digit job number (01–99) and then press the "SAVE" button.

   3b. Press the "INDEX" button (the job index screen displays). Press the "UP" and "DOWN" buttons to locate an empty job number location (10 dots in the display field to the left of the number indicate an empty location). When an empty job number location has been found, press the "SAVE" button.

   Note! If the location already contains a job, the "WARNING! THIS STORE CONTAINS DATA. DO YOU WISH TO CONTINUE?" message displays. Pressing the "YES" button overwrites the location with the new job information. (The job title screen displays.) Pressing the "NO" button returns you to the job index screen, where you can select a different location.

   Note! The job title screen displays after completing either of the actions in step 3.

4. In the job title screen, use the "DOWN" and "UP" buttons to select a letter.
5. Press the "SELECT" button to enter the letter into the display. (The cursor will automatically move to the right.)
6. Select additional letters until you have entered the job name.

Note! To erase letters, you press the "BACK" button. To add a space between letters, you press the "SPACE" button.

7. Press the "EXIT" button (the level-1 menu screen displays).
8. Press the "EXIT" button again (the main-menu screen displays).

Loading a Job

To load a job that has previously been saved:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "JOB STORE" button (The job store screen displays.)
3. Perform one of the following actions (3a or 3b):

   3a. Enter a job number and then press the "LOAD" button.

   3b. Press the "INDEX" button to display the stored jobs (the job index screen displays). Press the "UP" or "DOWN" buttons to locate the desired job name and number. When the desired job name and number location have been found, press the "LOAD" button to initiate the loading process. Press the "EXIT" button. (The job store screen displays.)

   Note! After completing either step 3a or step 3b, the "LOADED" message appears in the job number display. The job that was selected is now the active gluing program.

4. Press the "EXIT" button. (The level-1 menu screen displays.)
5. Press the "EXIT" button again. (The main-menu screen displays.)

Repeating Glue Patterns

For information on how to repeat glue patterns, see Appendix A.

Clearing Data

Both the level-1 menu screen and the level-3 menu screen have "CLEAR DATA" buttons. However, the "CLEAR DATA" button in the level-3 menu screen has the capability of erasing all data, and the "CLEAR DATA'' button in the level-1 menu screen is capable of clearing data only for the current job.

To clear data, follow these steps:

1. In the level-3 menu screen, press the "CLEAR DATA" button. (The clear-data warning screen displays.)
2. Press one of the three buttons described in 2a., 2b., and 2c.:

   2a. Pressing the "YES" button erases the current job's delay and glue patterns and returns the product-length setting to zero.

   Note! Once you press the "YES" button, the data is erased and cannot be retrieved.

   2b. Pressing the "NO" button returns you to either the level-1 or the level-3 menu screen without erasing any data.

   2c. Pressing the "ALL" button resets the following parameters (level-3 menu screen only):

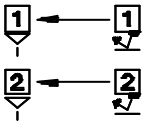
   - Delay and pattern lengths in jobs 1-99 will be erased.
   - Product length = 0
   - Scan mode (2-channel model only) = SCAN 1 or 2
   - Glue mode = DEL PAT
   - Minimum speed = 0
   - Cell-to-gun = 0
   - Ratio compensation = 100
   - Compensation channels 1-4 = 0
   - In/metric = metric
   - Pin code access = deactivated
   - Language = English

   Note! Once you press the "ALL" button, the data is erased and cannot be retrieved.

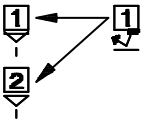
Specifying the Scanner Mode

Two scanner modes are available for the control:

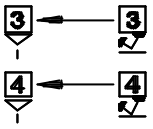
- ***SCAN 1 or 2***—Scanner 1 is used to scan product for channel 1. Scanner 2 is used to scan product for channel 2.



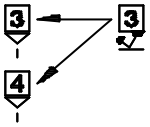
- ***SCAN 1 1-2***—Scanner 1 is used to scan product for both channel 1 and channel 2.



- ***SCAN 3 or 4***—Scanner 3 is used to scan product for channel 3. Scanner 4 is used to scan product for channel 4.



- ***SCAN 3 3-4***—Scanner 3 is used to scan product for both channel 3 and channel 4.



To specify the scanner mode, follow these steps:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "MORE" button. (The level-2 menu screen displays.)
3. Press the "SCAN MODE" button in the level-2 menu screen. (The scan-mode screen displays.)
4. Choose a scan mode by pressing the appropriate scan mode button.

   Note! The arrow between the two buttons points to the scan mode that is currently selected.

5. Press the "EXIT" button to return to the level-2 menu screen.

For additional scanner configurations, see Appendix C.

Specifying the Glue Mode

With a two-channel control, two glue modes are possible:

- "DEL PAT"—In this mode, a single delay (or skip) dimension and a single pattern dimension are displayed on the main screen. When both channels are in this mode, a single main screen displays the delay and pattern dimensions for channel 1 across the top of the main screen and dimensions for channel 2 across the bottom of the main screen.
- "DEL PAT DEL PAT"—In this mode, a single delay (or skip) dimension and a single pattern dimension are displayed across the top of the main screen, and a second pair of delay and pattern dimensions are displayed across the bottom of the main screen. When either or both channels are in this mode, multiple main screens display the delay and pattern dimensions for a single channel only.

To select the glue mode, follow these steps:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "MORE" button. (The level-2 menu screen displays.)
3. Press the "GLUE MODE" button. (The glue-mode screen displays.)

   Note! Each of the two channel buttons (CHAN 1 and CHAN 2) toggles between DEL PAT and DEL PAT DEL PAT.

4. Press the "CHAN 1" button to set the channel 1 glue mode to either "DEL PAT DEL PAT" or "DEL PAT".
5. Press the "CHAN 2" button to set the channel 2 glue mode to either "DEL PAT DEL PAT" or "DEL PAT".
6. Press the "EXIT" button to return to the level-2 menu screen.

Specifying the Delay and Pattern Values

To specify delay and pattern values, follow these steps:

1. At the main-menu screeen, press any of the number fields for channel 1 (Figure 25). The glue pattern edit screen displays.

Note! You use the plus and minus buttons on the glue pattern edit screen to enter values for the delay and for the glue pattern. The delay fields are located on the left side of the screen and the glue pattern fields are located on the right side of the screen.

2. At the first glue pattern delay field, enter the distance from the leading edge of product to the beginning of the first glue pattern. This distance will be entered in either inches (01.00 = 1 inch) or millimeters depending on the setup of your control.
3. At the first glue pattern length field, enter the length of the glue pattern. This distance will be entered in either inches (01.00 = 1 inch) or millimeters depending on the setup of your control.

Note! A minimum of 00.01" or 0001 mm must be entered for the delay setting to activate the channel.

4. At the second glue pattern delay field, enter the distance from the end of the first glue pattern to the beginning of the second glue pattern.
5. At the second glue pattern length field, enter the length of the second glue pattern.
6. Press the "PAGE DOWN" button to see pattern information for the next channel.
7. Repeat steps 1 through 6 for channel 2.

Specifying the Product Length

A non-zero value for the product length enables the jam detection and scanner lockout functions. The value entered should be approximately 2 inches (50 mm) longer than the actual product. To specify the product length, follow these steps:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "PRD LENGTH" button. (The product-length screen displays.)
3. Using the numeric keypad, input the length of the product plus two inches (50 mm).
4. Press the "ENTER" button. (The "OK DONE" message displays.)
5. Press the "EXIT" button to return to the level-1 menu screen.

Glue Pattern Example:

Scanner mode	=	"SCAN 1 1-2"
Glue mode	=	"DEL PAT DEL PAT"
Inch/metric	=	Metric

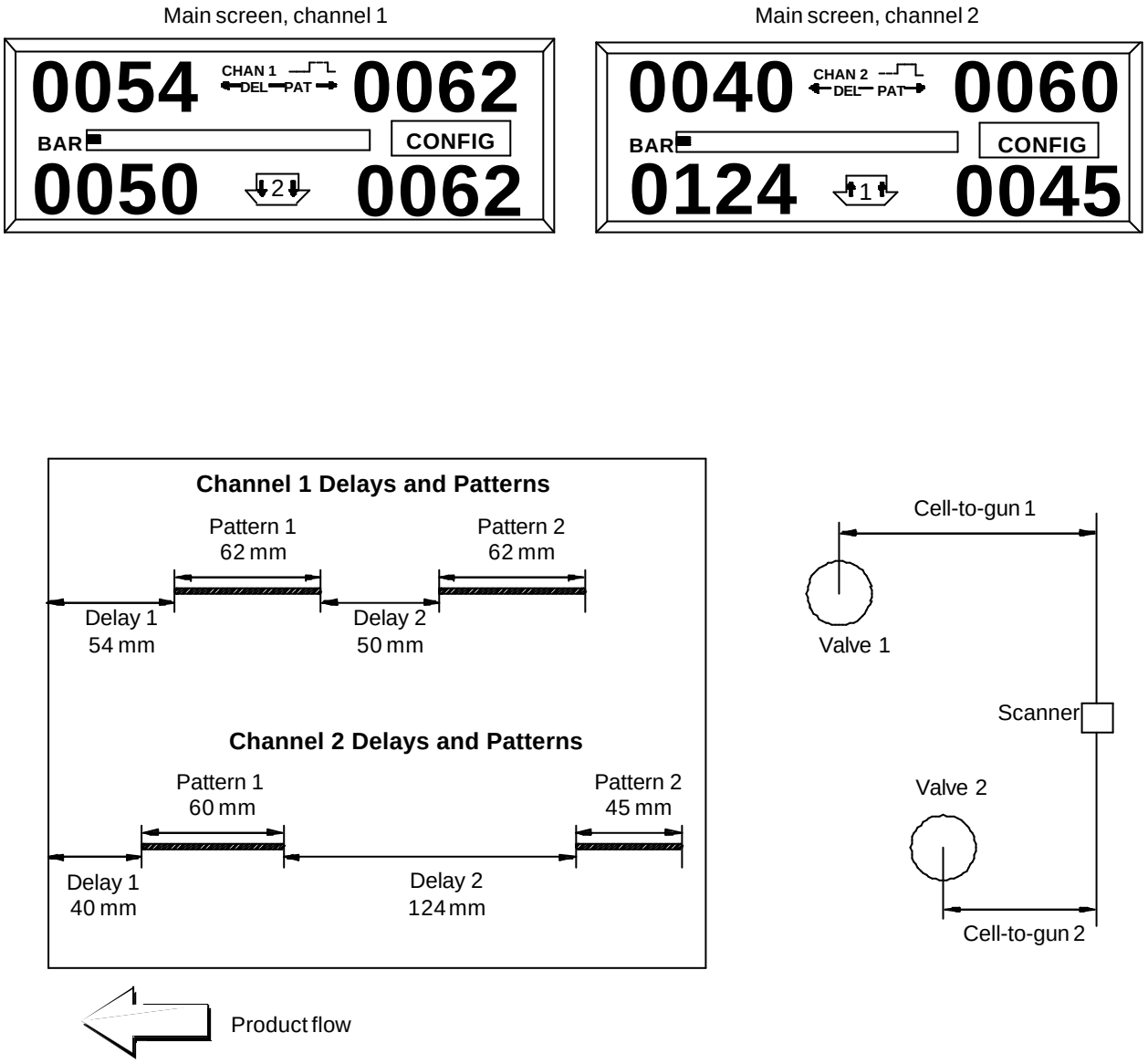


Figure 25. Glue Pattern Example

Introduction

This section contains possible solutions to problems that you may experience.

Problem	Possible Solution
Power	
1. Front panel lights and touchscreen do not illuminate.	1a. Check fuses in the power entry module (bottom panel). 1b. Check that the proper voltage shows through the fuse door of the power entry module. 1c. Check that the on/off switch is in the on ("|") position. 1d. Replace power supply board.
2. Lights illuminate but the touchscreen is dark.	2a. Check the "F1" fuse on the power supply board. 2b. Replace power supply board 2c. Replace touchscreen.
3. 12V input voltage front-panel indicator does not illuminate.	3a. Check the "F1" and "F2" fuses on the power supply board 3b. Replace power supply board.
4. 5V logic voltage front-panel indicator does not illuminate.	4a. Check the "F1" fuse on the power supply board. 4b. Replace power supply board.
Scanner	
1. Front-panel scanner indicator does not illuminate when a product is in the scanner's detection field.	1a. Check the distance between the scanner and the product (see the Installation section of this manual). 1b. Ensure that the scanner cable is connected at the scanner and at the control. 1c. Check for damage to the scanner cable. 1d. Check the "F2" fuse on the power supply board.
2. Front-panel scanner indicator does not turn off.	2a. Ensure that the scanner is not too close to a machine element.

Problem	Possible Solution
Encoder	
1. Front-panel encoder indicator does not illuminate when the product line is moving.	1a. Ensure that the encoder's measuring wheel is securely against the parent machine surface and does not slip during operation. 1b Check the "F2" fuse on the power supply board. 1c. Check for damage to the encoder cable. 1d. Replace encoder.
2. "X/MIN" (greater than minimum speed) front-panel indicator does not illuminate.	2a. The minimum speed setting is too high.
Glue Valve	
1. The lower portion of the channel valve indicator does not illuminate.	1a. Check the delay ("DEL") and pattern ("PAT") settings. (A delay of at least "00.01" inches or "0001" millimeters must be entered in order to activate the channel.) 1b. Check that the channel toggle switch on the front panel is in the enabled ("1") position.
2. Glue valve does not dispense glue.	2a. Check the delay ("DEL") and pattern ("PAT") settings. (A delay of at least "00.01" inches or "0001" millimeters must be entered in order to activate the channel.) 2b. Check that the channel toggle switch on the front panel is in the enabled ("1") position. 2c. Check that the line speed is above the minimum speed setting. 2d. Check for a clogged glue valve. 2e. Check for damage to the glue valve's cable. 2f. Check the "F1", "F2", and "F3" fuses on the valve driver board. 2g Replace valve driver board.
Glue Pattern	
1. At low speed, the delay is too short or too long before the pattern starts.	1a. Ensure that the delay value has been correctly entered. 1b. Ensure that the product length has been correctly entered. 1c. Ensure that the ratio compensation has been correctly entered. 1d. Ensure that the cell-to-gun value has been correctly entered.
2. At low speed, the pattern length is too short or too long.	2a. Ensure that the pattern value has been correctly entered. 2b. Ensure that the product length has been correctly entered. 2c. Ensure that the ratio compensation has been correctly entered.

Problem	Possible Solution
Glue Pattern, continued	
3. At high speed, the delay is too short or too long before the pattern begins.	3a. Ensure that the delay value has been correctly entered. 3b. Ensure that the delay is correct at low speed. 3c. Ensure that the turn-on compensation has been correctly entered.
4. At high speed, the pattern length is too short or too long.	4a. Ensure that the pattern value has been correctly entered. 4b. Ensure that the pattern length is correct at low speed. 4c. Ensure that the turn-off compensation has been correctly entered.

Introduction

This section contains descriptions of the controls's internal components (Figure 26).

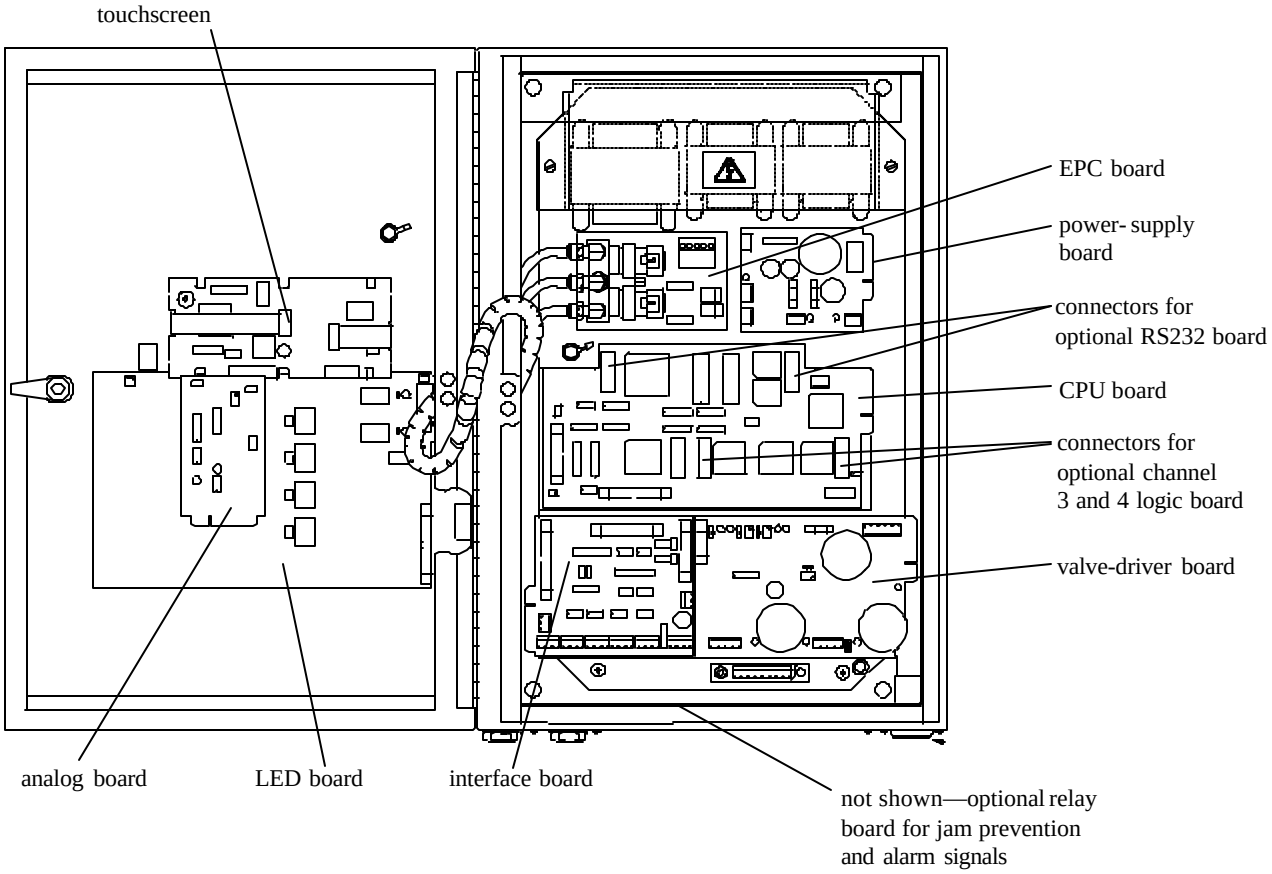


Figure 26. Internal Components of the VC3500

CPU Board

PN 151xx362

Connectors	
J1, J2	Connection for the optional RS232 daughter board
J3	Connection to LCD/touchscreen module via a 20-pin ribbon cable
J4	Connection to glue inspection board (VC3700 only)
J5, J6	Connection for the optional channel 3 and 4 logic daughter board.
J7 (not used)	In early models, connection to LED board to deliver analog pressure feedback signal to CPU
J8	Connection to interface board via a 26-pin ribbon cable
J9	Connection for 17VDC supply voltage from the power supply board
Indicators	
D1 (Reset)	When lit, this red LED indicates that the main processor (68000) is being given a hardware reset.
Jumpers	
2/4 Channel Select	A wire jumper near the center of the board determines whether two-channel or four-channel software is utilized: • Installed—A jumper installed dictates that two-channel software is use. • Not installed—No jumper dictates that four-channel software is used.
Switches	
A pushbutton near the upper left corner provides a manual reset function.	
Test Points	
TP1 (CLOCK)	8 MHz, 5V digital clock signal from Oscillator U7 for main processor U1.
TP2 (CNTR-CLK)	5V encoder signal gated by a timer from U17 (68230, PB6). These gated encoder pulses are counted by U9 (74HCT293). Periodically, the 68000 main processor queries this binary count through port lines PA0 through PA7 of U17. The 68000 main processor then calculates line speed from knowing the number of encoder pulses in a given time period.
TP4 (PRESSURE)	This analog signal (0 to 5VDC) represents the air pressure sensed by the EPC-6.
TP3 (MIN SPEED)	This signal will be low when the line speed is Greater than minimum speed. This signal will be high when the line speed is Lower than minimum speed.
TP5 (+5V)	Small pad located near lower right corner of board.
TP6 (GND)	A U-shaped pad on the right edge provides the reference for all logic signals.

Channel 3 and 4 Logic Board

PN 151xx363

Connectors	
J5, J6	Connection to the CPU board

Analog Board

PN 151xx364

Connectors	
J1, J2	Connection to the LED board
Jumpers	
JP1	**Low Pressure Limit Select** A low air-pressure limit may be selected for delivery to glue source. Normally, this is set to 0%. Other possible selections are 10, 25, and 50% of full pressure.
Potentiometers	
P1 (Bar 0-Adj)	Allows adjustment of the pressure bar graph on the LCD/touchscreen to a minimal length for zero speed.
P2 (Gain Adj)	Not used. In early models, allowed adjustment to gain of frequency-to-voltage converter U3. Increasing the gain will increase the analog voltage at J2, pin 3 (to the EPC) for a given frequency of encoder pulses.

LED Board

PN 151xx365

Connectors	
CO1	Connection to interface board via a 30-pin ribbon cable.
J2	Connection for 17VDC supply voltage from the power supply board
J3, J4	Connection to analog daughter board
J5	Connection to EPC via a four-conductor cable
J6, J7	Connection for front-panel channels 1 and 2 enable switches
J10	Connection for front-panel pressure-adjust switch

Interface Board

PN 151xx366

Connectors	
CO1	Connection to LED board via a 30-pin ribbon cable
CO2	Connection to CPU board via a 26-pin ribbon cable
CO3	Connection to valve driver board(s) via a 20-pin ribbon cable
J1, J2, J3, J4	Connection for product scanners
J5	Connection for encoder
J6	Connection for machine interface board for machine-stop relay
J7	Connection for 17VDC supply voltage from power supply board
J8	Connection for dump-valve (glue by-pass valve)
Replacement Fuses	
12 VDC I/O Supply	Label—F1 Type—PC Mount Value—1.5A Valco Number—085xx132
Dump Valve Active	Label—F2 Type—PC Mount Value—1.5A Valco Number—085xx132
Indicators	
D1 (12 V)	When lit, this green LED indicates that the 12VDC supply for scanners, encoder, and by-pass valve (dump valve) is operational.
D2	When lit, this yellow LED indicates that the bypass valve is activated and that the parent machine is above minimum speed.
Jumpers	
JP1 and JP2	**Valve Driver Type** Pins 1 and 2 jumpered—Use of valve driver board Pins 2 and 3 jumpered—Future use
JP3	Pins 2 and 3 jumpered—Normal
JP4	Pins 2 and 3 jumpered—Normal

Valve Driver Board

PN 151xx367

Connectors	
J1	Connection to interface board via a 10-pin ribbon cable
J2	Connection for transformer secondary voltages to form the 56VDC peak voltage and the 12VDC hold voltage
J3	Connection for the first glue valve on this card
J4	Connection for the second glue valve on this card
Indicators	
D1 (IN1)	When lit, this yellow LED indicates that an input signal has been received from the Interface board to energize glue valve 1.
D2 (IN2)	When lit, this yellow LED indicates that an input signal has been received from the interface board to energize glue valve 2.
D3 (12 V)	When lit, this green LED indicates that the 12VDC hold voltage is available to energize a glue valve.
D4 (15 V)	When lit, this green LED indicates that 15VDC input to regulator U3 is present.
D5 (56 V)	When lit, this green LED indicates that the 56VDC peak voltage is available to energize a glue valve.
D6 (HOLD-1)	When lit, this yellow LED indicates that the 12VDC hold voltage is applied to glue valve 1.
D7 (PEAK-1)	When lit, this yellow LED indicates that the 56VDC peak voltage is applied to glue valve 1.
D8 (HOLD-2)	When lit, this yellow LED indicates that the 12VDC hold voltage is applied to glue valve 2.
D9 (PEAK-2)	When lit, this yellow LED indicates that the 56VDC peak voltage is applied to glue valve 2.
D10 (Fault F2)	When lit, this red LED indicates a fault with fuse F2.
D11 (Fault F3)	When lit, this red LED indicates a fault with fuse F3.
Replacement Fuses	
Hold voltage current limit	Label—F1 Type—5 x 20 mm Value—5A Valco Number—085xx206
Channel 1 current limit	Label—F2 Type—PC Mount Value—5A Valco Number—085xx216
Channel 2 current limit	Label—F3 Type—PC Mount Value—5A Valco Number—085xx216

Jumpers	
JP1	**Common/Independent Output Control**
	Pins 1 and 2 jumpered—For the first valve driver board (channels 1 and 2), this causes both outputs to be controlled from channel 1 program parameters. For the second valve driver board (channels 3 and 4), this causes both outputs to be controlled from channel 3 program parameters.
	Pins 2 and 3 jumpered—Allows outputs to be controlled independently
JP2	**Fixed/Variable Peak Voltage duration for Channel 1**
	Pins 1 and 2 jumpered—Forces a fixed peak voltage duration of 3.5mS for channel 1.
	Pins 2 and 3 jumpered—Allow adjustment of peak voltage duration of 1mS to 10mS for channel 1 using potentiometer P1.
JP3	**Fixed/Variable Peak Voltage duration for Channel 2**
	Pins 1 and 2 jumpered—Forces a fixed-peak voltage duration of 3.5mS for channel 2.
	Pins 2 and 3 jumpered—Allows adjustment of peak voltage duration of 1mS to 10mS for channel 2 using potentiometer P2.
JP4	**Fixed/Variable Hold Voltage level**
	Pins 1 and 2 jumpered—Forces a fixed-hold voltage level of 12 V.
	Pins 2 and 3 jumpered—Allows adjustment of hold voltage level of 5 V to 12 V using potentiometer P3.
Potentiometers	
P1 (PTIME1)	Provides adjustment between 1mS and 10mS for channel 1 Peak Voltage duration when JP2 has a jumper between pins 2 and 3. Clockwise rotation increases duration.
P2 (PTIME2)	Provides adjustment between 1mS and 10mS for channel 2 Peak Voltage duration when JP3 has a jumper between pins 2 and 3. Clockwise rotation increases duration.
P3 (HOLDV)	Provides adjustment between 5V and 12V for hold voltage level when JP4 has a jumper between pins 2 and 3. Clockwise rotation increases hold voltage level.

Power Supply Board

PN 151xx368

Connectors	
J1	Connection for transformer secondary voltages to form the DC logic voltages used on other boards.
J2	Connection to supply the 12VDC supply voltage to the LCD/touchscreen's LED backlight
J3	Connection to supply the 17VDC supply voltage to the LED board
J4	Connection to supply the 17VDC supply voltage to the CPU board
J5	Connection to supply the 17VDC supply voltage to the interface board
J7	Connection to supply the 32VDC supply voltage to DD-1 pump

Replacement Fuses	
CPU/LED current limit	Label—F1 Type—5 x 20 mm Value—3.15A Valco Number—085xx208
I/O current limit	Label—F2 Type—5 x 20 mm Value—1.6A Valco Number—085xx209
DD-1 pump current limit	Label—F3 Type—5 x 20 mm Value—1.6A Valco Number—085xx209
Indicators	
D1 (LCD supply)	When lit, this green LED indicates that the 12VDC supply voltage is available to light the LED backlight.
D2 (Logic supply)	When lit, this green LED indicates that the 17VDC supply voltage is available to power the CPU board
D3 (Intrfc supply)	When lit, this green LED indicates that the 17VDC supply voltage is available to power the interface board.
D4 (Pump supply)	When lit, this green LED indicates that the 32VDC supply voltage is available to power the DD-1 pump.

RS232 Board

PN 151xx375

Connectors	
J1, J2	Connection to the CPU board
J3	Connection for serial port via ribbon cable
Jumpers	
JP1	Hardware/software handshaking: Pins 2 and 3 jumpered—Normal configuration (software handshaking, CTS and RTS connected) Pins 1 and 2, 3, & 4 jumpered—Not used (hardware handshaking)
JP2, JP3	Cable-type selection Pins 1 and 2 jumpered—Normal configuration (DB9 to DB9 null modem cable) Pins 2 and 3 jumpered—DB9 to DB25 and special cables **Note!** P2 and JP3 must be jumpered in the same manner.

EPC Board

PN 151xx379

Connectors	
J1	Connection for 12VDC power supply, input analog signal, intake output signal, and exhaust/sensor output signal
Indicators	
CR1 (12 V supply)	When lit, this green LED indicates that the 12VDC supply voltage is available.
CR2 (Intake)	When lit, this yellow LED indicates that the Intake solenoid is active.
CR3 (Exhaust)	When lit, this yellow LED indicates that the Exhaust solenoid is active.
Jumpers	
JP1 (E/S Out)	**Output Signal Select** • Pins 1 and 2 jumpered—Makes the E-OUT signal available at J1, pin 5, allowing an external device to monitor the exhaust solenoid condition. • Pins 2 and 3 jumpered—Makes the S-OUT signal available at J1, pin 5, allowing an external device to monitor the Sensor (transducer) analog signal.
Potentiometers	
P1 (Span)	Provides adjustment of transducer signal gain, allowing an anticipated small transducer excursion to effect a full scale (0 to 12V) change at TP2.
P2 (Zero)	Provides adjustment for nulling the pressure transducer signal at zero pressure
P4 (Gain)	Provides adjustment of feedback loop gain and affects the hysteresis (and frequency) for switching the intake and exhaust solenoids (not installed on later models)

Relay Board

PN 151xx404

Connectors	
J1	Connection to drive machine interface relay from either J6 of the Interface board or J1 of the glue inspection board
J2	Connection to supply beacon and alarm signals from the glue inspection board (151xx410).
J3	External connector used for interfacing the machine interface relay to the parent machine stop circuit.
J4	External connector used for interfacing a beacon/alarm for jam and glue-fault conditions.
Indicators	
D1 (RLY)	When lit, this yellow LED indicates that the machine interface relay is energized.
Replacement Fuses	
Beacon current limit	Label—F1 Type—PC Mount Value—3A Valco Number—085xx207

Specifications

Control Dimensions

Height:	19.55" (497mm)
Depth:	5.6" (142mm)
Width:	13.44" (341mm)
Input voltage:	115/230VAC, 2/1A, 50/60Hz (field-switchable)

Scanners

Inputs:	One per channel
Type/voltage:	NPN/sinking/12VDC
Configuration:	Independent for each channel or one linked to channels 1 and 2 and one linked to 3 and 4.

Valve Outputs

Channels:	Two (four optional), one valve per channel
Peak voltage:	+56V, 1–10ms adjustable (maximum 600W instantaneous per channel, not to exceed 10% duty cycle)
Hold voltage:	+5V to +12V, adjustable

Encoder

Inputs:	One (40kHz maximum)
Type/voltage:	VCE-1000 recommended, 12VDC

Miscellaneous

Maximum gluing speed:	2000 feet (610m) per minute
Maximum glue length:	99.99" (2539mm)
Flow control:	Internal (EPC-6)
Maximum glue pressure:	100 psi (7 bar)
Job storage capacity:	99 jobs
Glue patterns:	One or two per channel
Scanner lockout function:	Internal
Jam preventer function:	Internal
Computer hardware interface:	RS-232 (optional) DB-9 socket, standard DTE
Machine interface relay:	Optional—one normally open and one normally closed contact, 60VDC, 25VAC, 2A

Part-Number List

How to Order Parts

To order parts, please contact one of the following.

Valco Cincinnati Incorporated
411 Circle Freeway Drive
Cincinnati, Ohio 45246
TEL: (513) 874-6550
FAX: (513) 874-3612

Valco Cincinnati Limited
Hortonwood 32
Telford, TF1 4 EU, England
TEL: (+44) 1952-677911
FAX: (+44) 1952-677945

Valco Cincinnati GmbH
Industriestrasse 25
D-32130 Enger/Westf
TEL: (+49) 5223-185511
FAX: (+49) 5223-188699

You can also contact a Valco sales representative in your country. If you have any problems or questions regarding the piston pumps or any other Valco equipment, call Valco's Technical Service Department at the numbers listed above.

VC3500 Parts List

Description	Part #
PC9 adhesive system pedestal, 0-125 psi (1-9.6 bar) glue regulator and manifold	738xx173
PC9 adhesive system pedestal, 0-650 psi (1-45.8 bar) glue regulator and manifold	738xx174
Machine mount, 0-125 psi (1-9.6 bar) glue regulator and manifold	738xx177
Machine mount, 0-650 psi (1-45.8 bar) glue regulator and manifold	738xx178
Beam assembly, for use with 578xx032 trolley bracket	581xx298
Filter/regulator/manifold assembly, 0-125 psi (1-9.6 bar)	593xx245
Filter/regulator/manifold assembly, 0-650 psi (1-45.8 bar)	593xx246
PC board assembly, touch-screen	151xx324
PC board assembly, EPC-6 pressure control	151xx379
PC board assembly, CPU	151xx362
PC board assembly, 2-channel logic with jam preventer and scanner lockout	151xx363
PC board assembly, analog	151xx364
PC board assembly, LED	151xx365
PC board assembly, interface	151xx366
PC board assembly, 2-channel valve driver	151xx367
PC board assembly, power supply	151xx368
PC board assembly, RS232	151xx375
PC board assembly, relay and beacon interface	151xx404

Description	Part #
Fuse, 2A, 5 x 20mm, power entry module	085xx040
Fuse, 5A, 5 x 20mm, valve driver board, F1	085xx206
Fuse, 5A, PC mount, valve driver board, F2, F3	085xx216
Fuse, 3.15A, 5 x 20mm, power supply board, F1	085xx208
Fuse, 1.6A, 5 x 20mm, power supply board, F2	085xx209
Ribbon cable, 30-pin, LED/Interface	033xx080
Ribbon cable, 20-pin, valve driver/interface	033xx081
Ribbon cable, 26-pin, CPU/interface	033xx082
Ribbon cable, 20-pin, CPU/display	033xx083
Ribbon cable, 10-pin, valve driver to valve driver supply cable	033xx084
Valve driver to valve driver supply cable	030xx442
Transformer panel assembly (includes the following): Transformer, 24V Transformer, 36V Transformer, 28V	036xx119 550xx047 550xx032 550xx020
Power entry module, 115/230VAC	086xx055
Cord grip panel assembly	084xx002
Channel enable switch assembly	030xx429
Pressure adjust switch assembly	030xx430
Installation kit (includes the following): Fuse, 2a, 5 x 20 mm, power entry module (1) Fuse, 5A, 5 x 20 mm, valve driver board, F1 (2) Fuse, 5A, PC mount, valve driver board, F2, F3 (4) Fuse, 3.15A, 5 x 20 mm, power supply board, F1 (2) Fuse, 1.6A, 5 x 20 mm, power supply board, F2 (2) Fitting, male connector 1/4 x 1/8 (1) Fitting, male connector 3/8 x 1/8 (1) Fitting, male elbow 1/4 x 1/8 (1) Fitting, male elbow 3/8 x 1/8 (1) Hex key (1) Gauge, 0–160 psi Adapter, 1/4 NPT (female) Street "T", 1/8 NPT Cable assembly, line cord (Europe), no end plug (1) Line cord clamp (Europe) (1) Cable assembly, line cord (US), with end plug (1) Line cord clamp (US) (1) Fuse, 5A, PC mount, valve driver board, F2, F3 (4) (alternate fuses for 585 valves)	781xx136 085xx040 085xx206 085xx216 085xx208 085xx209 797xx323 797xx328 797xx338 797xx342 794xx453 786xx002 797xx029 797xx018 030xx422 066xx116 030xx493 066xx120 085xx216

Description	Part #
Snap track for CPU P.C. board	091xx382
Rivets, plastic (for mounting snap track)	091xx374
Extraction tool for chips	781xx174
I.C. Chip Assembly (U4, U5, U18, U19/20)	119xx052
Floppy disk for RS-232 interface (used by OEM for interfacing Valco equipment with OEM equipment)	119xx047

Optional Parts List

Description	Part #
Machine stop relay and beacon interface	084xx008
Beacon with audible alert	481xx033
Beacon cable	030xx555
Connector (field-wireable connector for machine-stop relay)	061xx216
Upgrade kit, 4-channel (used to upgrade 2-channel 3500 only)	084xx012

Recommended Spare Parts List—Mechanical

Description	Quantity	Part #
Valve seal kit (366-valve)	1	706xx178*
Repair kit, standard 585 non-contact valve	1	703xx304*
Repair kit, 2-inch extended 585 non-contact valve	1	703xx558*
Repair kit, 4-inch extended 585 non-contact valve	1	703xx305*
Soft-seal stem tip for TF612 and 712 non-contact valve	5	703xx797*
Spring, internal for TF612 and 712 non-contact valve	5	793xx271*
Repair kit for 832 fluid pressure regulator	1	593xx038
Repair kit for DD-1 pump	1	560xx560
12VDC 3-way air solenoid	1	411xx057*
Encoder timing belt	1	788xx300*
Encoder measuring wheel	1	788xx553*
Filter screen, 50-mesh	1	593xx020*
Filter screen, 100-mesh	1	593xx087*
0-ring, glue filter cap	1	745xx059

* Check the type of part on your system before ordering

Recommended Spare Parts List—Electrical

Description	Quantity	Part #
LED scanner assembly	1	280xx105*
Fixed-field sensor	1	280xx093*
VCE-250 encoder	1	155xx027*
VCE-500 encoder	1	155xx029*
VCE-1000 encoder	1	155xx031*
PC board, touchscreen	1	151xx324**
PC board, CPU	1	151xx362**
PC board, channel 3 and channel 4 logic	1	151xx363**
PC board, analog	1	151xx364**
PC board, LED	1	151xx365**
PC board, interface	1	151xx366**
PC board, 2-channel valve driver	1	151xx367**
PC board, power supply	1	151xx368**
PC board, RS232	1	151xx375**
PC board assembly, EPC-6 pressure control	1	151xx379**
Fuse, 2A, power entry module	1	085xx040
Fuse, 5A, valve driver board, F1	1	085xx206
Fuse, 5A, valve driver board, F2, F3	1	085xx216
Fuse, 3.15A, power supply board F1	1	085xx208
Fuse, 1.6A, power supply board F2	1	085xx209

* Check the type of part on your system before ordering

** Customer's discretion on ordering as a spare part

Recommended Spare Parts List—DD-1 Pump

Description	Quantity	Part #
Rebuild and spare parts kit	1	560xx602

Warranty Information

Valco Cincinnati, Inc. warrants its equipment worldwide against defects in material and workmanship as outlined in this section.

Cold-Glue Equipment and Electronic Controls

One (1) year from the date of shipment by Valco Cincinnati.

Hot-Melt Units, Hoses, Valves, and Related Equipment

All components except cast-in heating elements are warranted for a period of six (6) months from the date of shipment by Valco Cincinnati. Cast-in heaters carry an additional, pro-rated warranty not to exceed three (3) years from the date of shipment by Valco Cincinnati.

Liability of the company is limited to repair of the product, or replacement of any part shown to be defective, and does not extend to defects caused by accidents, misuse, abuse, neglect, tampering or deterioration by corrosion. This warranty does not cover those items determined by Valco Cincinnati, Inc. to be normal wear items such as seals, O-rings, diaphragms, springs, etc.

Reconditioned equipment, unless specified otherwise at the time of purchase, will be warranted as described above for a period of ninety (90) days from the date of shipment by Valco Cincinnati.

Components purchased by Valco Cincinnati, Inc. from others for inclusion in its products are warranted only to the extent of the original manufacturer's warranty. In no event shall Valco Cincinnati, Inc. be liable for indirect or consequential damages arising out of the use of Valco Cincinnati products.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to Valco Cincinnati, Inc. for examination and verification. If claimed defect is verified, repairs or replacements will be made F.O.B. Cincinnati, Ohio, U.S.A. or ex-works Telford, U.K. If the inspection of the equipment does ***not*** disclose any defect of workmanship or material, any necessary repairs will be made at a reasonable charge and return transportation will be charged.

This is the only authorized Valco Cincinnati, Inc. warranty and is in lieu of all other expressed or implied warranties, representations or any other obligations on the part of Valco Cincinnati, Inc.

Service Needs

If you have problems with your system, please contact your Valco Cincinnati representative. If your need is urgent, we encourage you to contact our corporate office in Cincinnati, Ohio, U.S.A. at (513) 874-6550, or Valco Europe in the United Kingdom at (+44) 1952-677911. If the problem cannot be resolved on the telephone, Valco will promptly arrange to have a technical representative visit your facility. Any charges for a service call will be quoted at that time.Any part that fails during the warranty period shall be returned prepaid to Valco Cincinnati by the customer for disposition.

Note! Upon request, Valco Cincinnati personnel are available to repair or replace such parts at the customer's facility. Charges for this service include travel time and expenses.

If an equipment problem is the result of customer abuse, improper installation or operation, all travel time, labor, parts, and expenses will be charged to the customer.

If the responsibility for a problem cannot be absolutely determined, the customer will be charged for travel time and expenses only. No charge will be made for parts and labor.

Appendix A

Using the Repeat Function

The repeat function allows a glue pattern to be repeated up to 99x (99 times). This can be used to implement a stitch pattern to reduce quantity of glue consumption. A repeat value of 00x disables the repeat function for that channel. When the repeat function is enabled using a value from 01 to 99, the channel's second delay and pattern are repeated that number of times. A value of 01x will repeat the second delay and pattern one time (it will be performed two times).

Example:

To repeat a glue sequence of 0.5" delay (gap) and 0.5" pattern (glue) for 20 inches on channel 1, follow these steps:

1. At the level-2 menu, press the "GLUE MODE" button. The glue mode screen displays (Figure 27).

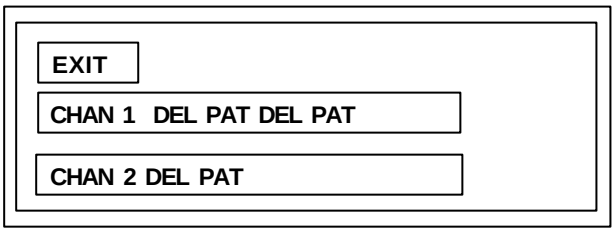


Figure 27. The Glue Mode Screen

2. Set the glue mode for channel 1 to DEL PAT DEL PAT (press the CHAN 1 button to toggle between the two selections).
3. Press "EXIT" to return to main screen.
4. At the main screen, touch one of the four-digit numbers on the top half of the screen. The glue-pattern edit screen displays (Figure 28).

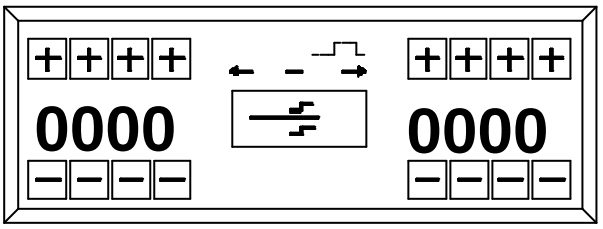


Figure 28. Glue-Pattern Edit Screen

5. Using the plus and minus keys, set the first delay (left parameter) to 00.50.
6. Using the plus and minus keys, set the first pattern (right parameter) to 00.50. (the first inch of the total 20 inches has now been programmed).
7. Press the symbol in the middle of the screen to return to the main screen.

8. At the main screen, touch one of the four-digit numbers on the bottom half of the screen. The glue-pattern edit screen displays (Figure 28).
9. Using the plus and minus keys, set the second delay (left parameter) to 00.50.
10. Using the plus and minus keys, set the second pattern (right parameter) to 00.50. (the second inch of the total 20 inches has now been programmed).
11. Press the symbol in the middle of the screen to return to the main screen.
12. Press the "CONFIG" button.
13. Press the "MORE" button in the level-1 menu screen. (The level-2 menu screen displays.)
14. Press the "REPEAT" button. (The repeat-function screen displays.)
15. Press channel 1. (The repeat setup screen for channel 1 displays.)
16. To program 18 additional inches of delay-pattern, press "1", and then press "8".
17. Press the "ENTER" button. The "OK DONE" message displays in the edit box and 18x displays in the repeat factor box (lower left corner).
18. Press the exit key to return to the level-2 menu.
19. Repeat steps 1-18 for channel 2.
20. Run the machine and check the pattern.
21. Adjust the first delay and pattern to move the last repeated glue pattern where desired.

Appendix B

RS232 Communications Interface

Do not install this upgrade with the power on. OTHERWISE, DEATH, PERSONAL INJURY, OR EQUIPMENT DAMAGE COULD OCCUR.

The RS232 is an upgrade/option that allows information to be sent or received between the control and a remote host computer. The RS232 upgrade/option consists of the following:

- Printed circuit board
- Internal cabling
- 20-foot serial data communications cable with DB-9 female connections on each end
- DOS-compatible demo disk.

Note! The RS232 board is sensed by the control automatically and requires no special setup by the user.

Location Codes

Location codes are required to instruct the control where to store its data.

Note! The VC3500 will not respond to data shown in location codes pertaining to channels 3 and 4. It will also not respond to data shown in location codes 3,4 and 7,8 unless the respective glue modes are set.

1 Channel 1—Delay length
2 Channel 1—Pattern length
3 Channel 1—2nd Delay length
4 Channel 1—2nd Pattern length
5 Channel 2—Delay length
6 Channel 2—Pattern length
7 Channel 2—2nd Delay length
8 Channel 2—2nd Pattern length
9 Channel 3—Delay length
10 Channel 3—Pattern length
11 Channel 3—2nd Delay length
12 Channel 3—2nd Pattern length
13 Channel 4—Delay length
14 Channel 4—Pattern length
15 Channel 4—2nd Delay length
16 Channel 4—2nd Pattern length
17 Channel 1—Cell-to-gun distance
18 Channel 2—Cell-to-gun distance
19 Channel 3—Cell-to-gun distance
20 Channel 4—Cell-to-gun distance
21 Channel 1—Turn-on compensation
22 Channel 2—Turn-on compensation
23 Channel 3—Turn-on compensation
24 Channel 4—Turn-on compensation

25 Channel 1—Turn-off compensation
26 Channel 2—Turn-off compensation
27 Channel 3—Turn-off compensation
28 Channel 4—Turn-off compensation
29 Product scanned length
30 Ratio compensation
31 Glue mode channel 1:
0000 for Delay-pattern
0100 for Delay-pattern-Delay-pattern-mode
32 Glue mode channel 2:
0000 for Delay-pattern
0100 for Delay-pattern-Delay-pattern-mode
33 Measurement mode:
0000 for metric mode
0200 for inch mode
34 Scan mode:
0000—Normal mode. Independent scanners for channels 1 through 4.
0100—Scanner 1 triggers channels 1 and 2. Independent scanners for Channel 3 and 4.
0200—Independent scanners for Channels 1 and 2. Scanner 3 triggers Channels 3 and 4.
0300—Scanner 1 triggers channels 1and 2. Scanner 3 triggers channels 3 and 4.
35 Speed in feet per minute (receive only). Bytes 4-1 are hexadecimal digits.
36 Repeat factor for channel 1 (0 = no repeat)
37 Repeat factor for channel 2 (0 = no repeat)
38 Repeat factor for channel 3 (0 = no repeat)
39 Repeat factor for channel 4 (0 = no repeat)
40 Marker station distance from glue station
41 Marker skip distance from leading edge of product
42 Marker mark distance
43 Tolerance codes for glue inspection
1 = ±0.2 inches (5mm)
2 = ±0.4 inches (10mm)
3 = ± 0.8 inches (20mm)
100 Regenerate or redraw front screen (send only)
101 Reset the control (send only)

Data Format

Four bytes of data are always sent or received with preceding zeros completing the four bytes. The most significant byte (MSB, byte 4) is sent or received first. The least significant byte (LSB, byte 1) is sent or received last. Each data type is the ANSI code of the data being sent or received. ANSI codes for characters 0-9 are shown in Table 1.

Table 1. ANSI Codes for Characters 1-9

Character	ANSI Code
0	48
1	49
2	50
3	51
4	52
5	53
6	54
7	55
8	56
9	57

Note! The Visual Basic "Chr$" function returns a one-character string whose ANSI code is the argument.

Distance-type data in inch units assume two decimal places. Therefore, if 0,1,0,0 were sent, either 01.00 inches or 0100mm would be specified, depending on the inch/metric setting of the control. Time-type data (in milliseconds) assume one decimal place. Therefore, if 0,0,5,5 were sent, 005.5 ms would be specified. Data for ratio compensation (in pulses per inch) also use one decimal place.

Sending Information from Host to VC3500

Information may only be sent or received by the control if the main screen (the screen containing the pressure bar graph) is visible. Data can be sent or received while the control is gluing. However, the programmer must take care not to leave the data partly sent, since the control will appear to lockout the touch screen and minimum speed detection! This can leave the control open to undesirable effects. It is possible to regain control from this situation by sending groups of at least six zeros to the control from the host, but it is always better to send or receive the complete data format.

Transfer of information uses the following format at 9600 baud, no parity, 8 data bits and 1 stop bit:

1. Send send-request byte from host.

   Send-request byte = 254dec.

2. Receive ACK (acknowledge) byte from VC3500.

   This indicates that the control will start looking for the data. After the request byte is received, the control returns ACK (255dec). If this byte is not returned after 500ms, the host must terminate the send.

3. Send byte 4, byte 3, byte 2, byte 1, location code from host.

   Byte 4=Msb and byte 1=Lsb.

Note! If the command is sent to redraw the front screen, the ACK signal can take up to 2 seconds to respond.

Example of Sending Data

Example:

Channel 1—Delay length = 100mm (1.00 inches)
Channel 1—Pattern length = 100mm (1.00 inches)

To send this information, follow these steps:

1. Send 254.
2. Wait for ACK.
3. Send 0,1,0,0,1.
4. Send 254.
5. Wait for ACK.
6. Send 0,1,0,0,2.

The front screen needs to be redrawn only after all the pattern data is sent, and only if the screen that the data is referenced to is visible. The control will respond to new data and update the glue line automatically upon reception of each new data packet, regardless of the information displayed by the screen.

It is better to send the redraw command after all of the data is transferred to the control, so that the data is sent at maximum speed. Timing problems may be encountered if attempts are made to redraw the screen after each send. If redrawing the screen after each send is required, a two-second delay (waiting for ACK) must be allowed for the redraw to take place.

To redraw the front screen, follow these steps:

1. Send 254.
2. Wait for ACK.
3. Send 0,0,0,0,100 (to redraw the front screen).

To set channel 1 turn-on compensation to 5.5ms:

1. Send 254.
2. Wait for ACK.
3. Send 0,0,5,5,21.

To set ratio compensation to 98.5 pulses:

1. Send 254.
2. Wait for ACK.
3. Send 0,9,8,5,30.

Receiving Information from VC3500

Receive information is required to update a secondary machine user interface, such as that found on a parent machine control.

The data is requested by the host computer, using the following format:

1. Send receive-request byte (from host).

   Receive-request byte = 253dec.
2. Receive ACK byte (from VC3500).
3. Send location code (from host).
4. Receive Byte 4, Byte 3, Byte 2, Byte 1 (from VC3500).

Example of Receiving Data

To display the first glue pattern length, follow these steps:

1. **Send 253.**
2. **Wait for ACK.**
3. **Send 2.**
4. **Receive b4,b3,b2,b1.**

Note! The measurement mode of the VC3500 control needs to be determined by the host in order for the host to display the information in inch or metric mode.

Note! When switching between the inch and metric modes via the RS232 link, the data is not converted accurately.

Appendix C

Introduction

The following configurations may be required for customer applications.

Using One Scanner to Trigger Four Independent Glue Valves

In order to use one scanner to trigger four independent glue valves, follow these steps:

Electrical Connections:

1. The “scanner-1” connector (J1 of interface board) must be used as the interface point for the single scanner used in this configuration. Connect the scanner cable to J1 on the interface board as follows:

   Pin 1: +12VDC
   Pin 2: Scanner signal
   Pin 3: Return

2. Install a jumper from J1, pin 2 to J3, pin 2 of the interface board.

Menu Setup:

3. In the level-2 menu screen, press the “SCAN MODE” button.
4. Press the “SCAN 1 1-2” button.
5. Press the “SCAN 3 3-4” button.

Applying Up To Four Patterns from a Single Glue Valve

In order to apply up to four glue patterns from a single glue valve, follow these steps:

Electrical Connections:

1. The “scanner-1” connector (J1 of the interface board) must be used as the interface point for the single scanner used in this configuration. Connect the scanner cable to J1 on the interface board as follows:

   Pin 1: +12VDC
   Pin 2: Scanner signal
   Pin 3: Return

2. Install a wire jumper from J3, pin 3 to J4, pin 3 on the valve driver board in order to parallel the outputs of Channels 1 and 2.
3. Connect the glue valve cable to J3 on the valve driver board as follows:

   Pin 1: Purge input
   Pin 2: Purge return
   Pin 3: Valve output
   Pin 4: Valve return

Menu Setup and Pattern Entry:

Note! If you have a four-channel control, skip to step 6.

4. In the level-2 menu screen, press the "GLUE MODE" button.
5. Select DEL PAT DEL PAT for both channels 1 and 2. (The "CHAN 1" and "CHAN 2" buttons toggle back and forth between DEL PAT and DEL PAT DEL PAT.)
6. In the level-2 menu screen, press the "SCAN MODE" button.
7. Press the "SCAN 1 1-2" button.
8. In the glue-pattern-edit screens for Channel 1, enter delay and pattern information for the first two patterns.
9. In the glue-pattern-edit screens for Channel 2, enter delay and pattern information for patterns three and four.

Applying Up To Eight Patterns from a Single Glue Valve

In order to apply up to eight glue patterns from a single glue valve, a four-channel control is required:

Electrical Connections:

1. The "scanner-1" connector (J1 of the interface board) must be used as the interface point for the single scanner used in this configuration. Connect the scanner cable to J1 on the interface board as follows:

   Pin 1: +12VDC
   Pin 2: Scanner signal
   Pin 3: Return

2. Install a wire jumper from J1, pin 2 to J3, pin 2 on the interface board.
3. Install a wire jumper from J3, pin 3 to J4, pin 3 on bottom valve driver board in order to parallel the outputs of channels 1 and 2.
4. Install a wire jumper from J3, pin 3 to J4, pin 3 on top valve driver board in order to parallel the outputs of channels 3 and 4.
5. Install a wire jumper from J4, pin 3 of bottom valve driver board to J4, pin 3 of top valve driver board in order to parallel the outputs of all four channels.
6. Install a wire jumper from J4, pin 4 of bottom valve driver board to J4, pin 4 of top valve driver board in order to interconnect the ground references for all four channels.
7. Connect the glue valve cable to J3 on the valve driver board as follows:

   Pin 1: Purge input
   Pin 2: Purge return
   Pin 3: Valve output
   Pin 4: Valve return

Menu Setup and Pattern Entry:

8. In the level-2 menu screen, press the "SCAN MODE" button.
9. Press the "SCAN 1 1-2" button and the "SCAN 3 3-4" button.
10. In the glue-pattern edit screens for channel 1, enter delay and pattern information for the first two patterns (see the "Operation" section of this manual).

11. In the glue-pattern-edit screens for channel 2, enter delay and pattern information for patterns 3 and 4.
12. In the glue-pattern-edit screens for channel 3, enter dealy and pattern information for patterns 5 and 6.
13. In the glue-pattern-edit screens for channel 4, enter delay and pattern informatin for patterns 7 and 8.

Appendix D

Introduction

This section contains specific information about the VC3500J control, which is a single-channel control.

Overview

Since the VC3500J is a single-channel control, the main screen displays the delay dimension in the upper left corner of the screen and the pattern dimension in the upper right corner of the screen. The lower portion of the screen displays a figure that enables the learn mode when pressed. Once the learn mode is enabled, the control measures the product length, subtracts the delay dimension on both the leading and trailing edges, and enters the remaining length into the pattern dimension. The control then glues any products that pass under the product scanner.

Installation of Product Scanner

In order to achieve optimum measurement capability, care must be taken in locating the product scanner and adjusting its sensitivity. To install the product scanner, follow these steps:

1. Locate the product scanner 1-2 inches above the product.
2. Apply power to the glue control.
3. Place product 0.75 to 1.00 inches below normal product travel.
4. Turn the adjustment screw counterclockwise until the LED is not illuminated.
5. Adjust the product scanner sensitivity by turning the adjustment screw clockwise just until the LED illuminates.

Electrical Installation of Remote Learn Button

The cable used to connect the remote learn button to the VC3500J control should have a minimum of two conductors (18-22 AWG) and a shield.

To connect the remote learn button to the control, follow these steps:

1. Insert the remote learn button cable into the control enclosure through a cord grip located on the bottom panel of the control.
2. Connect the remote learn button cable to the three-terminal connector labeled “scanner 2”.

   Connections are as follows:

   Pin 1: No connection

   Pin 2: Signal

   Pin 3: Return
3. Connect shield wire to the protective earth (P.E.) terminals located near cord-grip base plate.
4. Tighten the cord grip used by the remote learn button cable.

Operation

To use the learn mode, follow these steps:

1. Type a delay dimension in the upper left corner of the main screen and press the ENTER key. This is the length of product not glued at both the leading and trailing edges.
2. Press the lower part of the main screen to enable the learn mode.
3. Allow one product to pass under the product scanner. (The control measures the product length, subtracts the delay dimension on both the leading and the trailing edges, and enters the remaining length into the pattern dimension.) Normal gluing will begin with the next product.

Note! Either the delay or pattern dimensions may be altered to affect changes in the glue pattern placement.

Menu Buttons

Since the VC3500 is a single-channel control, the following menu buttons are omitted:

Level-2 menu screen—SCAN MODE< GLUE MODE

Level-3 menu screen—CELL-GUN 2, CELL-GUN 3, CELL-GUN 4

Level-4 menu screen—COMP CHAN 2, COMP CHAN 3, COMP CHAN 4

Appendix E—Maintenance Procedures

Introduction

This appendix contains recommended daily, weekly, 3-month, 6-month, and 12-month maintenance procedures for the VC3700 system.

The maintenance procedures contained in this appendix are to be used for cold-glue systems only. OTHERWISE, DAMAGE TO EQUIPMENT COULD OCCUR.

Daily Maintenance

Action	Date	Shift	Initials
1. Clean the exterior portion of the glue valves, nozzle tips, glue heads, etc. 2. Purge the glue valves if necessary, and ensure proper glue flow. 3. Ensure that air and glue pressure settings are correct. 4. If using glue inspection: Ensure that sensor is clean. (Lens must be clean and clear with no scratches.) Check sensor for proper height adjustment. Adjust for proper sensitivity if necessary.			

Weekly Maintenance

Actions	Date	Shift	Initials
1. Clean the glue filter thoroughly with water.			
2. *For electric-coil non-contact valves only*—disassemble the fluid section of the glue valve, and clean the section thoroughly with water.			
3. If you are using a 585 valve, replace the valve spring.			
4. *For non-contact valves only*—lubricate the valve with Teflon oil (supplied with maintenance kit).			
5. Reassemble the fluid section.			
6. Using the 3-way purge valve on the output of the glue filter, purge all air from the system.			
7. Purge each valve in the system. (Approximately 1-2 ounces of glue should be purged for proper glue flow.)			
8. Check for any glue leakage on the needle seat. Replace the needle/plunger assembly and seat if leaks or dripping occurs.			
9. *For non-contact valves only*—Apply a small amount of lithium grease to the nozzle seat area before attaching the retaining nut.			
10. Check all quick-disconnect fittings for any dried glue or swelling that may restrict the glue flow.			
11. Lubricate each quick-disconnect fitting with lithium grease or equivalent.			

3-Month Maintenance

Actions	Date	Shift	Initials
1. Encoder mounting: a. Check timing belt, gear and pulley teeth, and proper timing belt tension.. b. If using measuring wheel, check for wear and proper wheel tension on machine belt. c. If using direct-drive encoder, check coupling and rotation of shaft for proper alignment. 2. Perform the "Weekly Maintenance" procedure.			

6-Month Maintenance

Actions	Date	Shift	Initials
1. Flush entire glue system, *except for the central pumping system*, with a vinegar and water solution (1 gallon of vinegar to 10 gallons of water). 2. Perform the "Weekly Maintenance" procedure.			

12-Month Maintenance

Actions	Date	Shift	Initials
1. Flush the entire glue system, *including the central pumping system*, with a vinegar and water solution (1 gallon of vinegar to 10 gallons of water). 2. Disassemble, thoroughly clean, and rebuild each fluid-regulator assembly and glue valve. 3. Perform the "Weekly Maintenance" procedure.			

VC3700 User's Manual

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CE Declaration of Conformity

(according to EN 45014)

Manufacturer:	Valco Cincinnati, Incorporated 411 Circle Freeway Drive Cincinnati, OH 45246 USA

declares that the product:

Product Name:	Glue Controller
Product Model(s):	VC3700
Year of Manufacture	1998

conforms to the following standards:

Safety:	EN 60204-1
EMC Emissions:	EN 50081-2 EN 55011, Class A
EMC Immunity:	EN 50082-2 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4
Degrees of Protection:	EN 60529-1, IP54

and complies with the requirements of:

Low Voltage Directive 73/23/EEC
EMC Directive 89/336/EEC

Office of CE Conformance
Cincinnati, Ohio USA

Table of Contents

Introduction

About this Manual

Valco Cincinnati has prepared this manual as an aid for installing, operating, and servicing the VC3700 control. This manual provides specific information about the unit, and general guidelines and references when discussing other equipment such as glue systems, scanners, encoders, and dispensing valves.

If you need more information, please contact your Valco Cincinnati representative.

Product Description

Valco's VC3700 is a sophisticated microprocessor control that provides precise adhesive delivery. It is a two-channel unit designed for use with up to two glue detection sensors. It will also operate up to four jam-prevention sensors.

The VC3700 is used for applications where consistent glue patterns are required at high machine speeds and during speed changes. The VC3700 provides complex glue patterns that can be difficult or impossible to obtain with other systems. The control operator can use the control's front-panel touch-screen to edit glue patterns while the parent machine is operating. The VC3700 also provides glue-inspection capabilities.

The VC3700 features a user-friendly, multi-language display; multiple pattern placement; speeds of up to 2000 feet (610 m) per minute; internal flow control; and optional RS-232 communications with external devices. The VC3700 control can store up to 99 fully programmed jobs.

Safety Information

General Information

It is the purchaser's responsibility to ensure that all local, county, state, and national codes, regulations, rules, and laws relating to safety and safe operating conditions are met and followed.

The best safeguard is trained personnel. The purchaser is responsible for providing personnel who are adequately trained to install, operate, and maintain Valco components and systems.

This section contains information that is essential to the safety of personnel. Safety information is included throughout the rest of the manual as well. The following safety conventions are used to indicate potential safety hazards:

WARNING! This symbol indicates the presence of un-insulated dangerous voltage within the product's enclosure. This voltage may cause electrical shock or fire. Failure to observe precaution may result in death, personal injury, and/or equipment damage.

WARNING! This convention is used to alert the user to important installation, operation, and/or maintenance information. Failure to observe precaution may result in personal injury or death.

CAUTION! This convention is used to alert the user to important installation, operation, and/or maintenance information. Failure to observe precaution may result in damage to equipment.

Warnings

All personnel involved with the installation, operation, and maintenance of the equipment must read and thoroughly understand the following warnings:

WARNING! Promptly repair or replace all worn or damaged electrical wiring and equipment wires to avoid danger to personnel.

WARNING! Properly route all electrical wires to avoid danger to personnel and damage to moving parts of machine.

WARNING! Disconnect all power before opening the control. Only qualified personnel should open and service the control.

WARNING! When making adjustments or performing checkout procedures, stay clear of any moving mechanical parts and do not touch exposed electrical equipment or electrical connectors.

WARNING! Keep pump cover and electrical enclosures closed except during setup, service, and checkout procedures.

WARNING! Promptly repair or replace all worn or damaged parts.

Routing Low-Voltage Leads

Electrical installation should be accomplished only by experienced service personnel!

When routing low-voltage leads, follow these guidelines:

- Do not route low-voltage leads in the same conduit as wires carrying a high-current load.
- Do not route low-voltage leads adjacent to, or across wires carrying a high-current load. If low-voltage leads must cross or run parallel to wires carrying high current, keep the leads at least 6" (152 mm) from high-current wires.
- Do not splice or solder leads.
- Trim leads to the required length. Leads should be only as long as necessary for installation.
- All wiring should be in conduits or wireways.

Connecting the Supply of Electrical Power

Electrical connections should be made only by experienced service personnel!

The control must be connected to a "clean" supply of electrical power. Use a dedicated circuit if possible—if a dedicated circuit is not available, do ***not*** connect the control to a circuit that supplies high-amperage equipment. Use another circuit such as a lighting circuit.

Introduction

This section describes the basic features of the 3700 control.

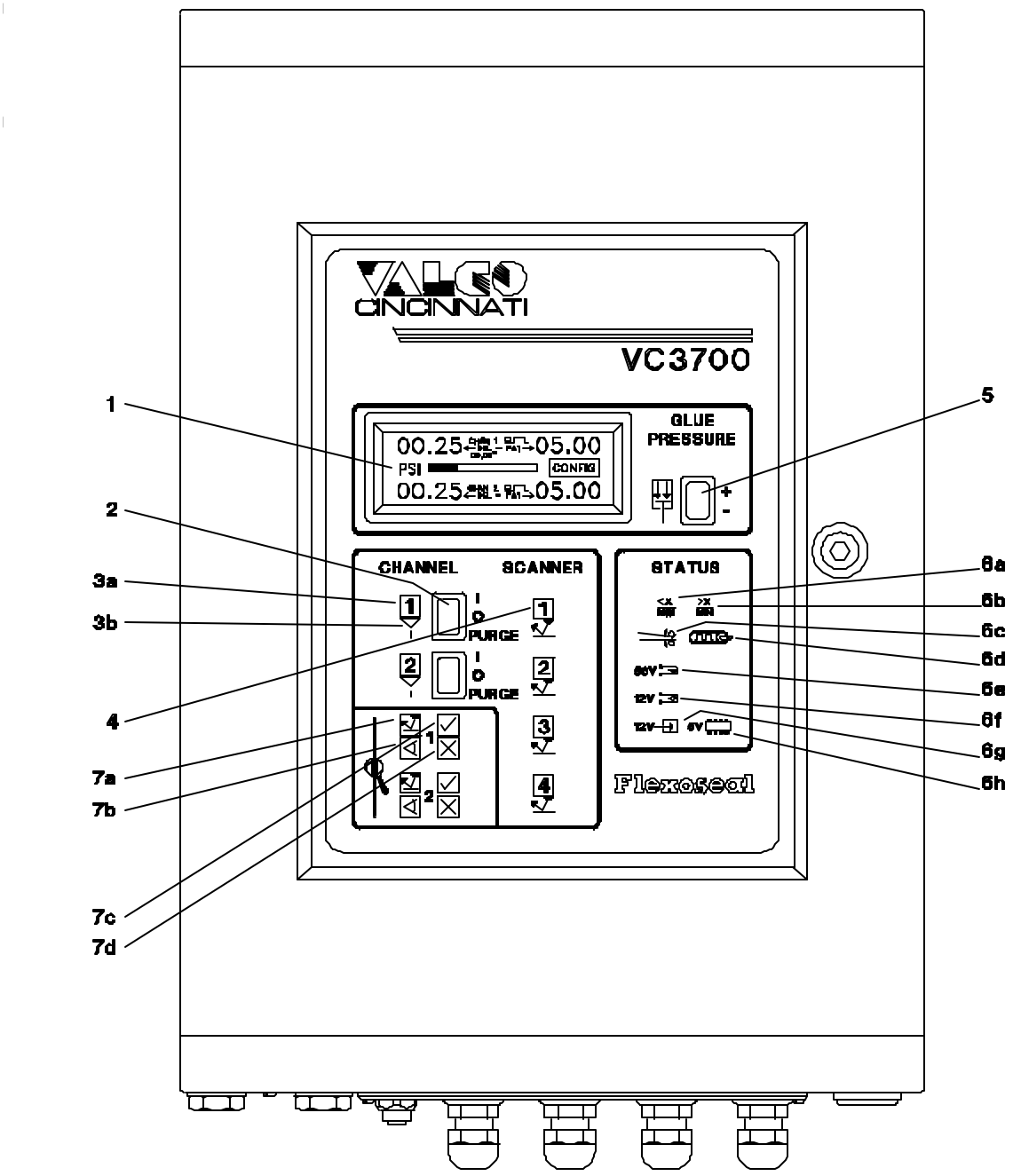


Figure 1. Front Panel of VC3700

Front-Panel Features

The following are descriptions of the features on the front panel (Figure 1).

1 Touch-screen display

All glue pattern parameters are entered and displayed using the touch-screen.

2 Valve enable switches

"|"—Valve is enabled and ready to dispense glue under program control.

"0"—Valve is disabled and will not dispense glue.

PURGE—Valve will dispense glue as long as the switch is manually held in this position.

3 Valve indicator lights (items 3a through 3b are valve indicator lights)

3a Valve enable indicator lights

This light illuminates when the valve enable switch is placed in the "|" (enabled) position (see item 2). This light will not illuminate when the valve enable switch is placed in the "0" (disabled) position.

3b Valve dispensing indicator lights

This light illuminates when the valve is dispensing glue (purge function or a programmed command).

4 Scanner indicator light

This light illuminates when the scanner detects product.

5 Glue pressure adjustment

You press this button to adjust glue pressure ("+" = increase and "-" = decrease).

6 Status indicator lights (items 6a through 6h are status indicator lights)

6a Less than minimum speed

"<X/MIN" illuminates when the speed of the parent machine is less than the minimum speed setting.

6b Greater than minimum speed

">X/MIN" illuminates when the speed of the parent machine is greater than the minimum speed setting.

6c Jam

This light illuminates when a scanner detects a product that is longer than the product length value entered in the control.

6d Encoder

This light illuminates when encoder pulses are received by the control.

6e 56V

"56V" illuminates when the 56-volt valve peak voltage is operational. This light will be illuminated under normal operating conditions.

6f 12V coil hold voltage

"12V" illuminates when the 12-volt valve hold voltage is operational. This light will be illuminated under normal operating conditions.

6g 12V input supply voltage

This light illuminates when the 12-volt supply for scanners and the encoder is operational. This light will be illuminated under normal operating conditions.

7 **Glue inspection indicator light** (items 7a through 7d are status indicator lights)

7a **Product scanner**

This light illuminates to indicate the start of the glue inpsection process. It remains illuminated as long as the product is being sensed.

7b **Glue sensor**

This light illuminates when the glue sensor detects the glue.

7c **PASS**

This light illuminates briefly if the glue line on the previous product ***is*** within the tolerance specified in the glue-QC setup screen. Intermittent, rapid flashing of the PASS light means that the control ***cannot determine if the*** glue line on the previous product is within the tolerance specified in the glue-QC setup screen.

7d **FAIL**

This light illuminates briefly if the glue line on the previous product is ***not*** within the tolerance specified in the glue-QC setup screen.

Bottom Panel Features

The following are descriptions of the features on the bottom panel (Figure 2).

1 **Air exhaust output**

This output is for air to exhaust to atmosphere. It is not normally connected.

2 **Air input**

Input for regulated air, 80-100 psi (6.5–8 bar).

3 **Computer interface**

DB-9 socket for optional RS232 communications (standard DTE)

4 **Air output**

This output is connected to the glue regulator to provide speed-dependent glue pressure.

5 **Optional machine interface** (items 5a and 5b are machine interface connectors)

5a **Beacon/horn connector**

See the "Installation" section for wiring details.

5b **Machine interface relay connector**

See the "Installation" section for wiring details.

6 **Power module**

This main power supply connection uses an IEC standard line cord (supplied). The fuse drawer in this module provides fuses for both sides of the main supply and selection of either 115 or 230VAC. The on/off switch for the control is also located on this module.

Note! Ensure that the proper fuse configuration for the power source is installed. See the "Installation" section for details.

7 **Line cord clamp**

Two clamps are included in the installation kit. One clamp fits the included European line cord and the other clamp fits the included North American line cord. The two 4-40 x 3/8" screws should be used to attach the clamp to the enclosure.

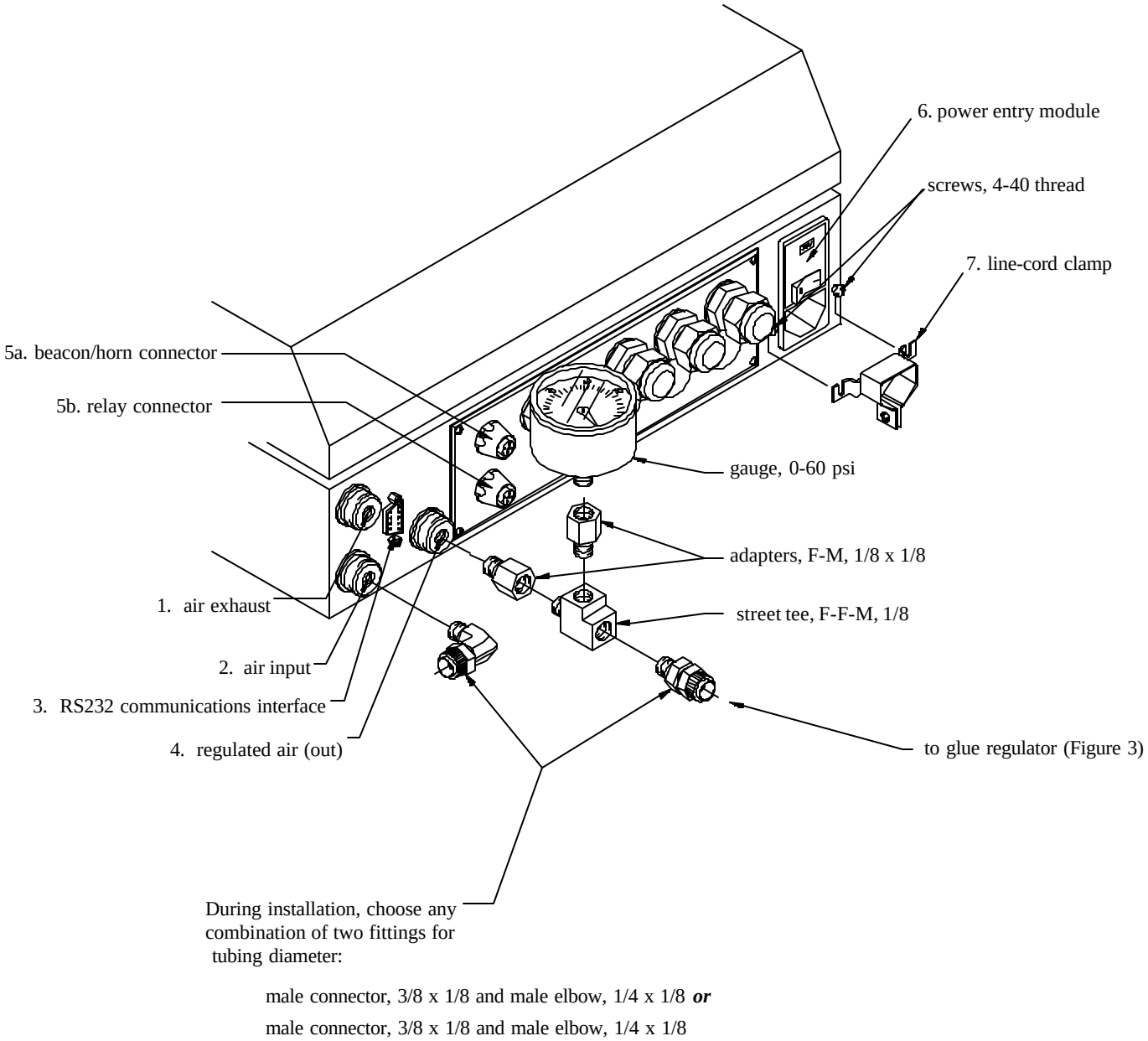


Figure 2. Bottom Panel of VC3700

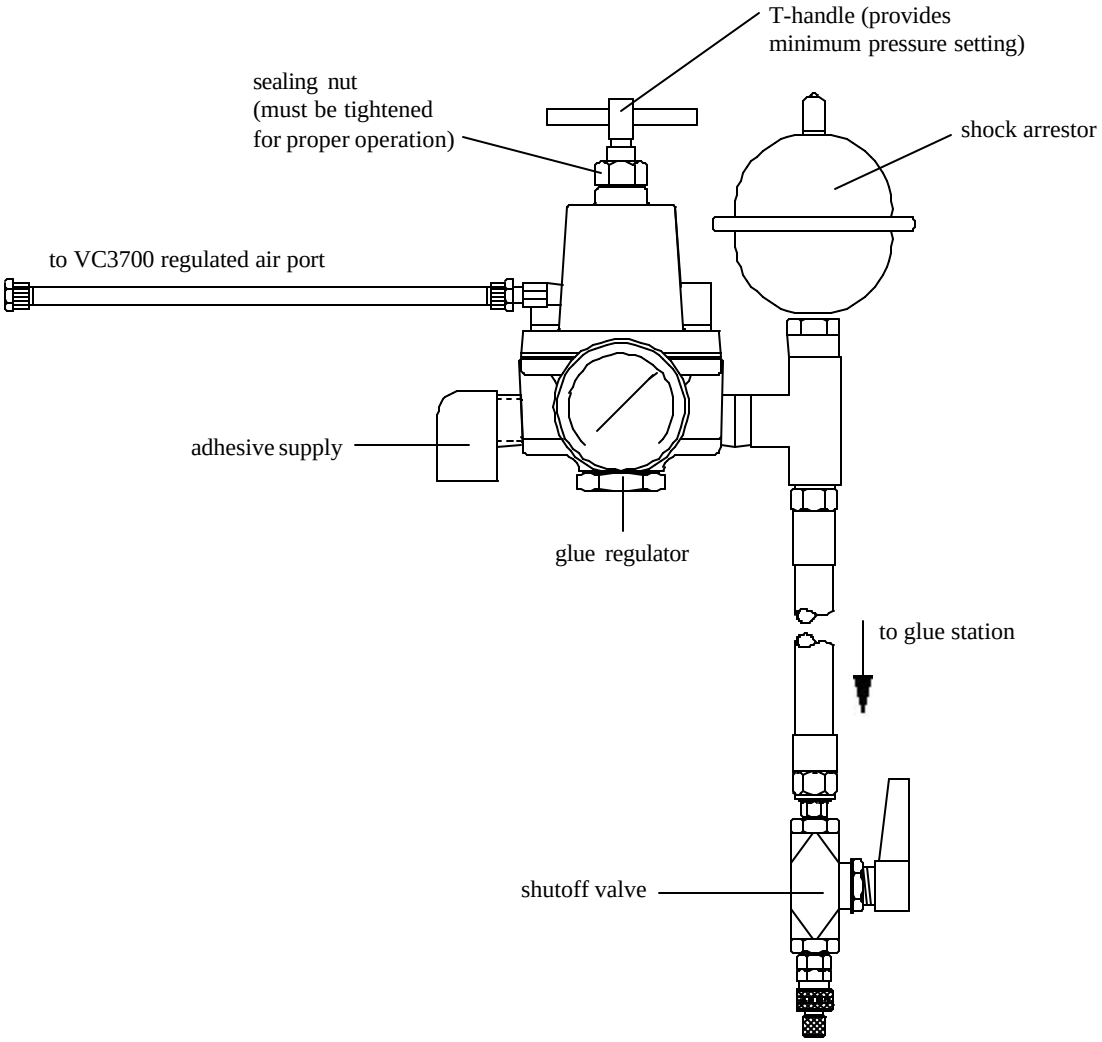


Figure 3. Glue Regulator

Introduction

This section contains both mechanical and electrical installation instructions. Read the “Safety” section in this manual before attempting these procedures.

Electrical installation should be accomplished only by experienced service personnel!

Refer to Figure 8 for detailed layout of internal connections.

Control Installation

Mechanical Installation of Control

The control should be installed on the operator’s side of the parent machine, in a location where vibrations will not occur. The control should require less than 25 feet (8 m) of wiring to reach the glue station, sensor,and shaft encoder (longer wiring is available on request). A 5/16" (8 mm) hex wrench can be used to unlock the door of the control enclosure.

To install the control, follow these steps:

1. Attach the control to a stationary, vertical surface, using the mounting holes located inside the control enclosure (see Figure 6).

Note! The control may also be mounted either to Valco’s machine-mount or mobile system pedestals (see Figures 4 and 5).

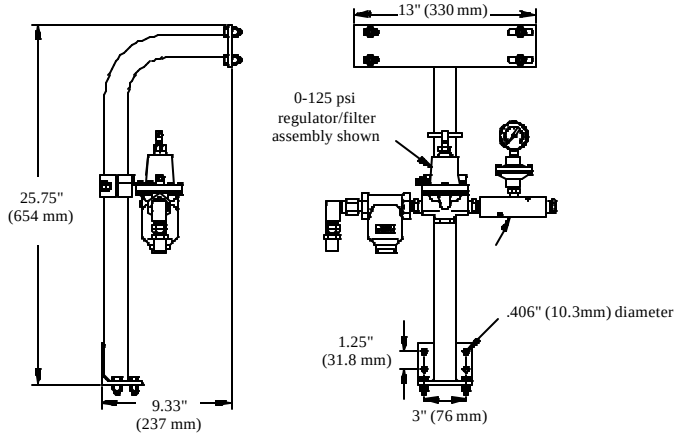


Figure 4. Machine-Mount System Pedestal

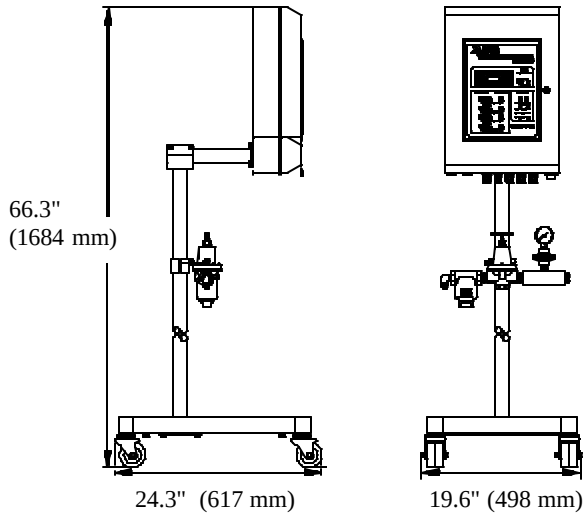


Figure 5. Mobile System Pedestal

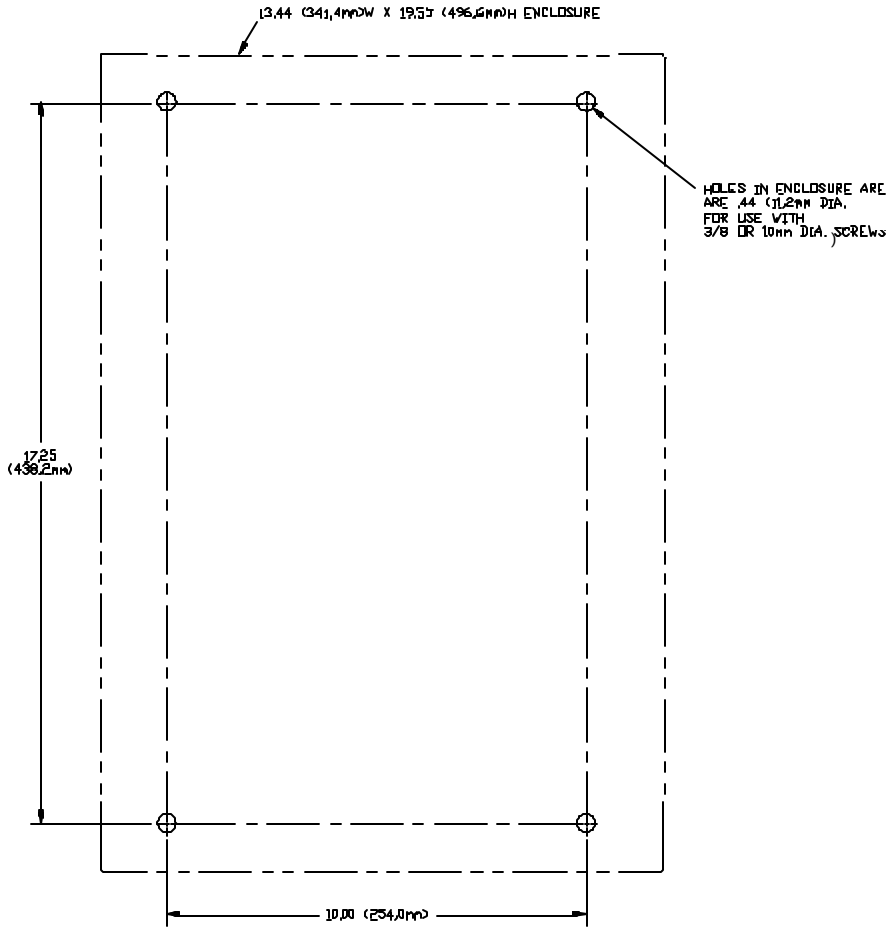


Figure 6. Mounting Hole Dimensions

Electrical Installation of Control

The main's supply must be 115/230 VAC, 50/60 Hz, 2/1 A. The 115/230 power requirement is field-switchable. The power module accepts a standard IEC line cord (supplied).

To connect the line cord, follow these steps:

1. Attach the line cord clamp to the bottom surface of the VC3700, using the two screws on either side of the power module.
2. Insert the line cord into the power module
3. Tighten the line cord clamp to prevent inadvertent loss of power.

Note! The line cord supplied can either be directly wired to a branch circuit or (with the proper plug type) plugged into a 115 or 230 VAC outlet socket. The wire colors of the supplied line cord are as follows:

Wire Type	International Line Cord Color	North American Line Cord Color
Line	Brown	Black
Neutral	Blue	White
Ground	Green/Yellow	Green

Mains Voltage and Fuse Selection

The fuse holder on the bottom panel of the power module contains the fuse drawer, which allows for either 115VAC or 230VAC operation (Figure 7).

To replace or check mains fuses, follow these steps:

1. Remove all electric power from the unit.
2. Remove the line cord.
3. Use a small screwdriver to open the hinged door of the fuse holder.
4. Remove the fuse drawer (ensure that the fuses in the holder remain in place).
5. The drawer is labeled "230V" and "115V." Rotate the drawer to the appropriate voltage.
6. For line-to-neutral operation, use the shorting clip (jumper) and one fuse. Shorting clip must be on left side (when rotated to read the correct voltage). For line-to-line operation, use two fuses.
7. Replace the drawer in the fuse holder and close the door of the fuse holder.
8. The operating voltage shows through the window in the fuse holder door. Ensure that voltage is correct.
9. Replace the line cord.

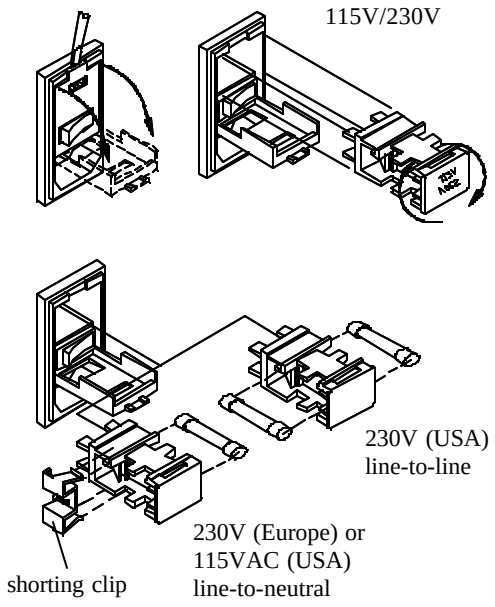


Figure 7. Fuse Drawer

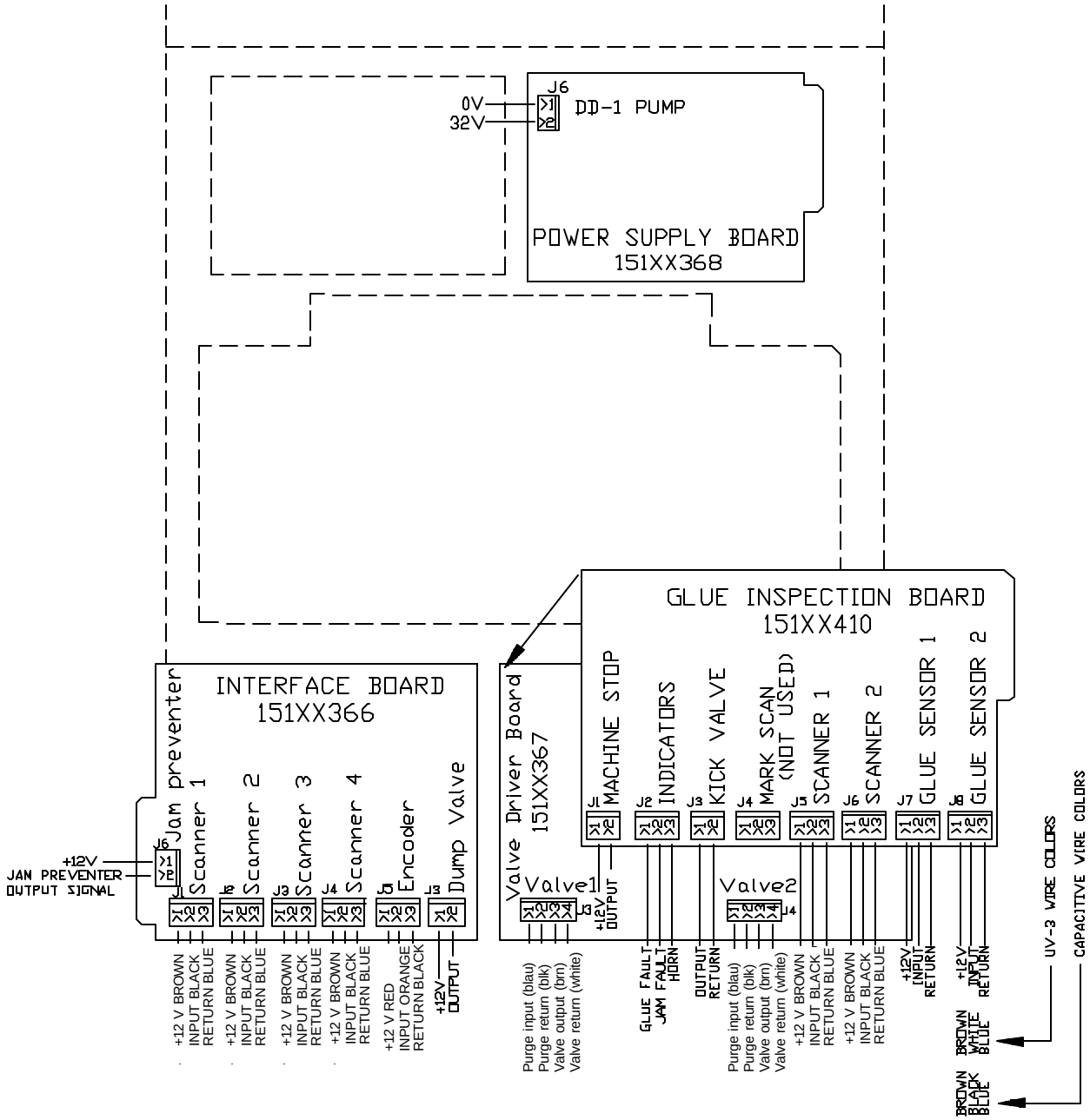


Figure 8. Internal Connections Diagram

Encoder Installation

Mechanical Installation of Encoder

An encoder must be installed in order for the control to determine the speed of the parent machine. For best results, 100 pulses per inch (25.4 mm) of product travel should be supplied to the VC3700. If less than 100 pulses per inch (25.4 mm) are supplied, poor resolution may result in pattern placement errors. If more than 100 pulses per inch (25.4 mm) are supplied, the maximum specified speed of 2000 feet/min (610 m/min) must be reduced.

There are two primary types of encoders:

- Wheel-driven encoder
- Gear-driven encoder

Wheel-Driven Encoder

If using a wheel-driven encoder (Figure 9), a VCE-1000 encoder with a 10-inch measuring wheel is recommended.

To install a wheel-driven encoder, follow these steps:

1. Mount the encoder's bracket to the frame of the parent machine.
2. Ensure that the wheel of the encoder rides securely against the belt and does not slip.

Note! The encoder assembly should be installed on the main drive belt if at all possible. Try not to use a belt that is driven by the friction of the drive belt, since this may cause slippage and erratic glue patterns.

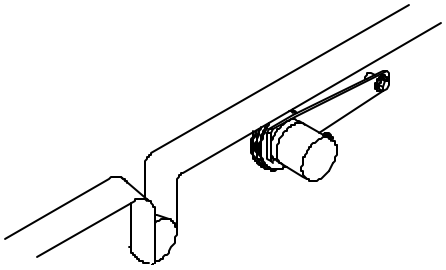


Figure 9. Example of a Wheel-Driven Encoder

Gear-Driven Encoder

The following formula can be used to determine the correct combination of gear teeth and encoder for approximately 100 pulse per inch (25.4 mm):

$$\frac{\text{Teeth-S}}{\text{Teeth-E}} \times \frac{\text{Counts}}{\text{Travel}} = \text{Pulses per inch (25.4 mm) of travel}$$

Teeth-S=Number of teeth on the line-shaft driver gear.

Teeth-E=Number of teeth on the encoder driven gear.

Counts=Number of encoder pulses per revolution.

Travel= Product travel in inches (or millimeters divided by 25.4) per revolution of the drive shaft.

Example:

Using a 92-tooth split line shaft gear (driver), a 24-tooth encoder driven gear, a 500-pulse encoder, and 18 inches (or 457 millimeters divided by 25.4) of travel per drive shaft revolution.

$$\frac{92}{24} \times \frac{500}{18} = 106.48$$

Therefore, the ratio compensation setting should be 106.5.

To install a gear-driven encoder (Figure 10), follow these steps:

1. Install the driver gear on the line shaft. Tighten the set-screws.
2. Position and install the encoder so that it is square with the driver gear.
3. Raise or lower the encoder to tighten the belt against the driver gear. (Ensure that the two sides of the belt are not pressed together under the wheel.) Due to the low torque required, the belt should not be extremely tight.

Note! At least 7-9 teeth should engage in the line shaft driver gear. It may be necessary to fabricate an adjustable bracket to connect the encoder base to the parent machine frame.

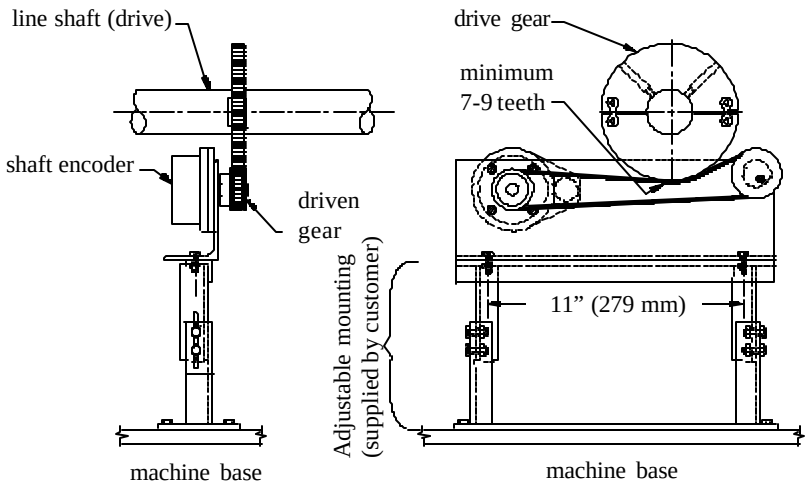


Figure 10. Typical Installation of a Gear-Driven Encoder

Electrical Installation of Encoder

A 12VDC encoder must be used with the VC3700 control. The cable used to connect the encoder to the control should have a minimum of three conductors (18-22 AWG) and a shield.

To connect the encoder to the control, follow these steps:

1. Insert the encoder cable into the control enclosure through a cord grip located on the bottom panel of the control.
2. Connect the encoder to the three-terminal connector (located inside the control) labeled "ENCODER".

Note! Connections are as follows (see Figure 8 for wire colors):

Pin 1: +12VDC

Pin 2: Encoder channel signal

Pin 3: Return

3. Connect the shield wire to the protective earth (P.E.) terminals located near the cord grip base plate.
4. Tighten the cord grip used by the encoder cable.

Note! An optional encoder/scanner A-B switch is available to enable one of two possible encoder/scanner pairs. This switch mounts to the base plate (Figure 11).

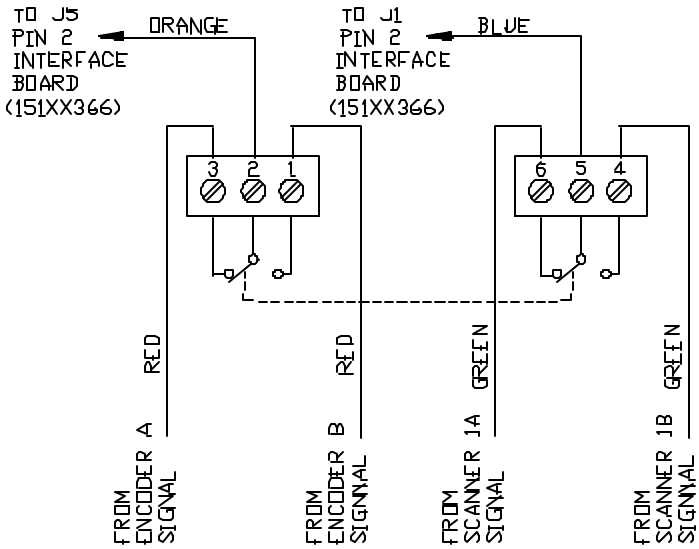


Figure 11. Wiring Diagram for Optional A-B Switch

Scanner Installation

Mechanical Installation of Scanner

At least one product scanner should be installed to detect the leading edge of the product. A single scanner can be used to start the glue patterns of both channel 1 and channel 2 or the channels can have two separate scanners.

To install the scanner, follow these steps:

1. Position the scanner assembly brackets upstream from the glue station (Figures 12 and 13).
2. Set the scanner 1.5 to 2.0 inches (38 to 51mm) above the product.

Note! The scanner must see through an open area on the parent machine with no obstructions.

Note! The distance between the scanner and the glue valve's nozzle (cell-to-gun distance) cannot exceed the distance from the leading edge of a product to the leading edge of the next product (repeat dimension). The minimum distance allowed between the scanner and the glue valve will be greater at high parent machine speed. The following is a general guide:

Speed	**Minimum Cell-to-Gun Distance**
100 ft/min (30.5 m/min)	1" (25.4 mm)
500 ft/min (152.4 m/min)	2" (51 mm)
1000 ft/min (304.8 m/min)	4" (102 mm)
1500 ft/min (457 m/min)	6" (152 mm)
2000 ft/min (610 m/min)	8" (203 mm)

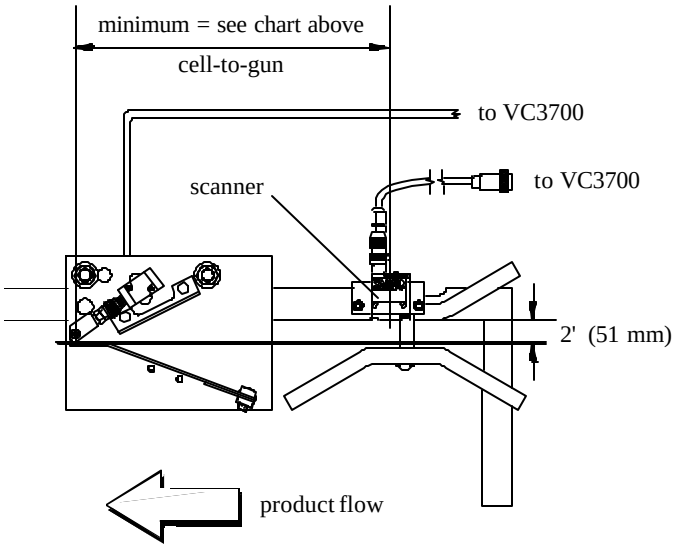


Figure 12. Top-Down Glue Station

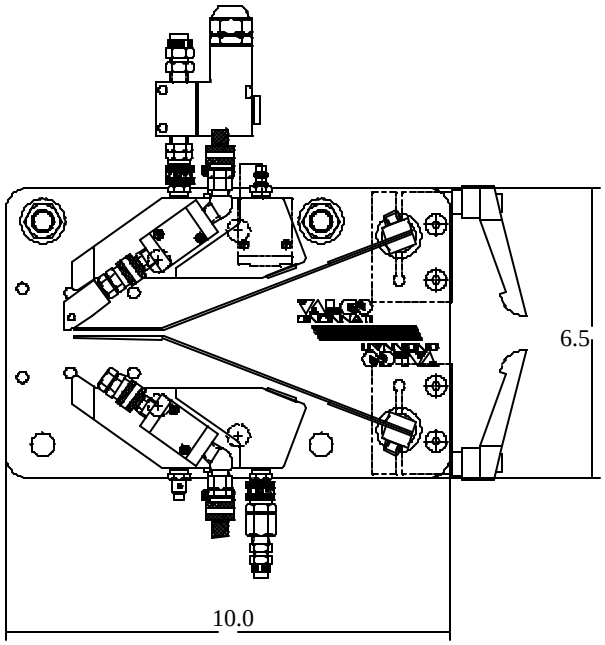


Figure 13. Top-Down, Bottom-Up Combination Glue Station

Electrical Installation of Scanner

The cable used to connect the scanner(s) to the VC3700 control should have a minimum of three conductors (18-22 AWG) and a shield.

To connect the scanner to the control, follow these steps:

1. Insert the scanner cable into the control enclosure through a cord grip located on the bottom panel of the control.
2. Connect the scanner cable to one of the three-terminal connectors labeled "scanner-1" and "scanner-2.

Note! The "scanner-1" connector must be used for the scanner installed for channel 1. This scanner can also be used to control channel 2. If separate scanners are desired to control channel 1 and channel 2, the "scanner-1" connector must be used for the scanner installed for channel 1, and the "scanner-2" connector must be used for the scanner installed for channel 2. Connections are as follows (see Figure 8 for wire colors):

Pin 1: +12VDC

Pin 2: Scanner signal

Pin 3: Return

3. Connect shield wire(s) to the protective earth (P.E.) terminals located near cord-grip base plate.
4. Tighten the cord grip used by the scanner cable (s).

Glue Valve Installation

Electrical Installation of Glue Valve

The glue valve cable should have a minimum of two conductors (18-20 AWG) and a shield (four conductors and a shield if a remote purge is required).

To connect the glue valve to the control, follow these steps:

1. Insert the glue valve cable into the control through a cord grip located on the bottom panel of the control.
2. Connect glue valve cable to the connectors labeled "valve-1" or "valve-2."

Note! The "valve-1" connector must be used for the glue valve controlled by channel 1. The "valve-2" connector must be used for the glue valve controlled by channel 2 (see the Internal Connections diagram). Connections are as follows (see Figure 8 for wire colors):

Pin 1: Purge output

Pin 2: Purge return

Pin 3: Valve output

Pin 4: Valve return

3. The shield wire should be connected to the protective earth (P.E.) terminals located near the cord grip base plate.
4. Tighten the cord grip used by the valve cable.

Machine-Stop Relay and Beacon Interface

An optional machine stop relay and beacon interface (option D1) is required to indicate a jam condition or glue inspection fault to the parent machine. Normally open and normally closed contacts are provided at a male connector mounted to the cord grip base plate. Contact rating is 24VDC or 24VAC at 2A.

When a jam condition is detected, the machine stop relay is energized. The relay is de-energized when the speed of the parent machine drops below the minimum speed setting (see the level-3 menu screen). The front-panel jam indicator also illuminates.

A field-wireable mating connector (Figure 13a) is provided to wire the relay contacts to the parent machine stop circuit. Connections are as follows:

Pins 1 and 2: Normally closed contact

Pins 3 and 4: Normally open contact

An optional beacon with audible alert can be remotely mounted to indicate a jam condition. A female connector mounted to the cord-grip base plate provides the connection point for beacon/alarm signals. Connections are as follows:

Pin 1: 12VDC

Pin 2: Glue fault (blue) light

Pin 3: Jam (red) light

Pin 4: Audible alarm signal

A pre-wired cable is provided with the beacon.

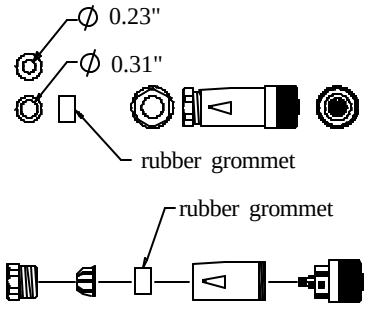


Figure 13a. Field-Wireable Connector

DD-1 Pump Power Supply

A source is available to supply power for a DD-1 pump at connector J6 of the power supply board (151xx368). This supply is 32VDC, fused at 1.6A, with connections as follows:

Pin 1: 0V

Pin 2: 32VDC

Since the DD-1 pump is configured to accept an AC source and then rectify it to DC, polarity of a DC source is not relevant.

Bypass Valve Driver

A bypass valve (or dump valve) may be needed to divert excess glue in the glue line away from the applicator to avoid puddling during startups and quick stops. A 12VDC, 1A driver is available at connector J8 of the interface board. Connections are as follows:

Pin 1: 12V

Pin 2: Signal

Glue Sensor Installation

There are two types of sensors:

- Capacitive sensor
- Ultra-violet (UV) sensor

WARNING! Only qualified technicians should install, assemble, or adjust the settings of the sensor.

CAUTION! The device must be protected against moisture and dirt when operating.

One glue sensor must be installed for each glue line to be inspected. A top-down bottom-up glue station should be used with the optional glue sensor bracket.

Capacitive Glue Sensor

Mechanical Installation

The capacitive glue sensor should be positioned to see through the product. Sensing through the product reduces the risk of adhesive collecting on the sensor, which may cause false activation of the glue sensor.

To set up the capacitive sensor, follow these steps:

1. Adjust the guide bars of the bracket so that there is approximately 1/16" (1.5 mm) clearance between the product and the upper and lower guide bars (Figures 14 and 15).
2. Position the sensor so that there is a 1/4" (6 mm) maximum between the detecting surface of the sensor and the product.

Note! Glue should be on the opposite side of the product from the sensor.

3. Tighten the screw on the housing to secure the sensor.

Electrical Installation

The cables used to connect the glue sensors to the control should have a minimum of three conductors (18–22 AWG) and a shield.

To connect the glue sensor to the control, follow these steps:

1. Insert the glue sensor cables into the control enclosure through the cord grip located on the bottom panel of the control.
2. Connect the glue sensor cables to J7 (glue 1) or J8 (glue 2) on the glue inspection logic board (see Figure 8). Connections are as follows:

   Pin 1: 12VDC

   Pin 2: Signal

   Pin 3: Return

3. Connect shield wire to the protective earth (P.E.) terminals located near the cord-grip base plate.
4. Tighten the cord grips used by the glue sensor cables.

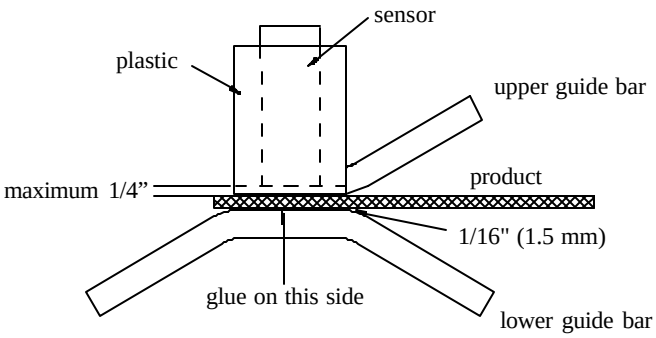


Figure 14. Typical Installation (Capacitive Sensor Only)

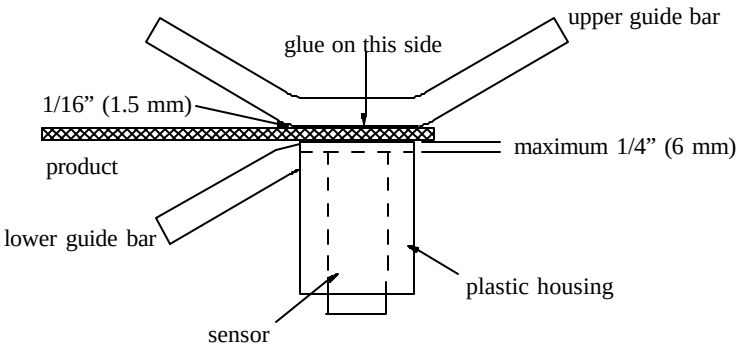


Figure 15. Typical Installation (Capacitive Sensor Only)

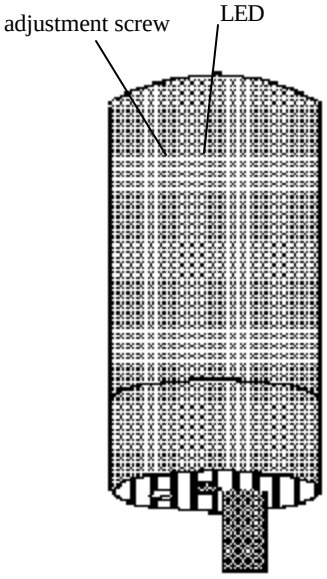


Figure 16. Capacitive Glue Sensor

Capacitive Glue Sensor Adjustment

To adjust the capacitive glue sensor, follow these steps:

1. Apply a glue pattern to the product.
2. Observe the LED on top of the sensor (Figure 16) while glue is within sensor's field of view.
3. ***If the LED is illuminated:***
    3a. Turn the adjustment screw counterclockwise until the light goes off.
    3b. Turn the adjustment screw clockwise until the LED comes on.
    3c. Turn the adjustment screw clockwise an additional 1/2 turn.
4. ***If the LED is not illuminated:***
    4a. Turn the adjustment screw clockwise until the LED comes on.
    4b. Turn the adjustment screw clockwise an additional 1/2 turn.

UV Sensor

Mechanical Installation

The UV glue pattern detection sensor is an optical, electronic sensor. It is used to detect fluorescent objects (such as UV liquid added to glue) optically and without contact.

To install the UV sensor, follow these steps:

1. Mount the sensor onto the guide bracket so that its sensing surface is approximately 1 inch (25mm) above the glue line being sensed.
2. Adjust the guiding bars so that the product has the least horizontal and vertical movement. Pay attention to the scanning range when adjusting the bars.
3. Connect the cable to the plug receptacle on the glue sensor.

Electrical Installation

The cables used to connect the glue sensors to the control should have a minimum of three conductors (18–22 AWG) and a shield.

To connect the glue sensor to the control, follow these steps:

1. Insert the glue sensor cables into the control enclosure through the cord grip located on the bottom panel of the control.
2. Connect the glue sensor cables to J7 (glue 1) or J8 (glue 2) on the glue inspection logic board (see Figure 8). Connections are as follows:
    Pin 1: 12VDC
    Pin 2: Glue sensor signal input
    Pin 3: Return
3. Connect shield wire to the protective earth (P.E.) terminals located near the cord-grip base plate.
4. Tighten the cord grips used by the glue sensor cables.

UV Sensor Time Delay Setting

The time-delay switch must be set to "0".

UV Sensor Sensitivity Setting

When the power is switched on, the green LED illuminates (ON). The yellow LED illuminates only when it detects a luminescent object (for example, UV liquid added to glue).

For objects to be detected against a background without luminescence, follow these steps:

1. Turn the sensitivity adjuster to maximum (clockwise). The luminescence sensor reacts to the luminescent glow and the output is switched.

For objects to be detected against a background with luminescence, follow these steps:

1. Turn the sensitivity adjuster to maximum (clockwise).
2. Position the background (with lower luminescence) in the light spot of the scanner.
3. Turn the sensitivity adjuster counterclockwise until the status indicator just switches off.
4. Note the position.
5. Position the luminescent glue in the light spot of the scanner.
6. Turn the sensitivity adjuster counterclockwise until the status indicator just switches off.
7. Note the position.
8. Reset the sensitivity adjuster to approximately halfway between the two positions.

The UV signal can be viewed using a piece of UV-sensitive copy paper. The UV signal emits several dot signals in a line. These dots should be slightly out of focus and perpendicular to the glue line. A right-angle lens is available to rotate the UV signal so it is perpendicular to the glue line.

Lens Replacement

The lens is screwed in and can be replaced by another lens. Scanning distances of 10, 20, 50, 90mm (.39, .78, 1.97, and 3.54 inches, respectively) are available. Standard lens should be 20mm. The luminescence intensitivity might be too weak if a scanning distance of more than 20 mm is used.

Maintenance

UV-3 sensors do not require any maintenance. However, periodically cleaning the optical lens and checking the connections is recommended.

Product Scanners for Glue Inspection

Mechanical Installation of Scanner

The product scanners for glue inspection must be located precisely opposite the glue sensors. The sensor must see the same edge as the scanner used in gluing.

To install the glue sensor, follow these steps:

1. Set the scanner 1.5 inches (38mm) above the product.

Note! The scanner must be able to see through open areas on the parent machine with no obstructions. Valco's standard scanner has a sensitivity adjustment on the top of the scanner.

Electrical Installation of Scanner

The cables used to connect the product scanners to the VC3700 control should have a minimum of three conductors (18–22 AWG) and a shield.

To connect the product scanners to the control, follow these steps:

1. Insert the product scanner cables into the control enclosure through a cord grip located on the bottom panel of the control.
2. Connect the product scanner cables to J5 (scanner 1) or J6 (scanner 2) on the glue inspection board (Figure 8). Connections are as follows:

   Pin 1: 12VDC

   Pin 2: Product scanner signal input

   Pin 3: Return
3. Connect shield wire to the protective earth (P.E.) terminals located near the cord-grip base plate.
4. Tighten the cord grips used by the product scanner cables.

Marker Valve or Kicker/Diverter Installation

Mechanical Installation

The unit must be less than 255 inches (6477 mm) from the product scanner used for glue inspection. It must also be less than 7 products from the scanner.

Electrical Installation

The cable used to connect the marker valve or kicker/diverter to the control should have a minimum of two conductors (18–22 AWG) and a shield.

To install the marker valve or kicker/diverter, follow these steps:

1. Insert the cable into the control enclosure through the cord grip located on the bottom panel of the control.
2. Connect the cable to J3 (KCK-VLV) on the glue inspection board (Figure 8). Connections are as follows:

   Pin 1: Return

   Pin 2: Drive signal (sourcing)
3. Connect the shield to the protective earth (P.E.) terminals located near the cord-grip base plate.
4. Tighten the cord grip used by this cable.

Menus

Introduction

This section describes the control's menus. The menus are displayed on touchscreens, which means that you push the button on the actual screen display,

Note! This section contains descriptions only—***not*** procedures. For specific procedures, see the "Initial Setup" and "Operation" sections.

Primary Menus

The VC3700 contains the following primary menu screens (Figure 17):

- ***Main screen***—The main screen is the screen that displays when power is supplied to the control.
- ***Level-1 menu screen***—The level-1 menu screen provides access to the job store screen, the job title screen, the job index screen, the product length screen, and the clear current data screen.
- ***Level-2 menu screen***—The level-2 menu screen provides access to the scan mode screen, the glue mode screen (two-channel model only), and the repeat function.
- ***Level-3 menu screen***—The level-3 menu screen provides access to the clear data screen (current job or all), the minimum speed screen, and the cell-to-gun screen.
- ***Level-4 menu screen***—The level-4 menu screen provides access to the product length screen, the ratio compensation screen, and the channel compensation screens.
- ***Level-5 menu screen***—The level-5 menu screen provides access to the inch/metric screen, the glue QC screen, and the PIN code screen.
- ***Level-6 menu screen***—The level-6 menu screen provides access to language selection.

These menu screens and their functions are described in the following paragraphs.

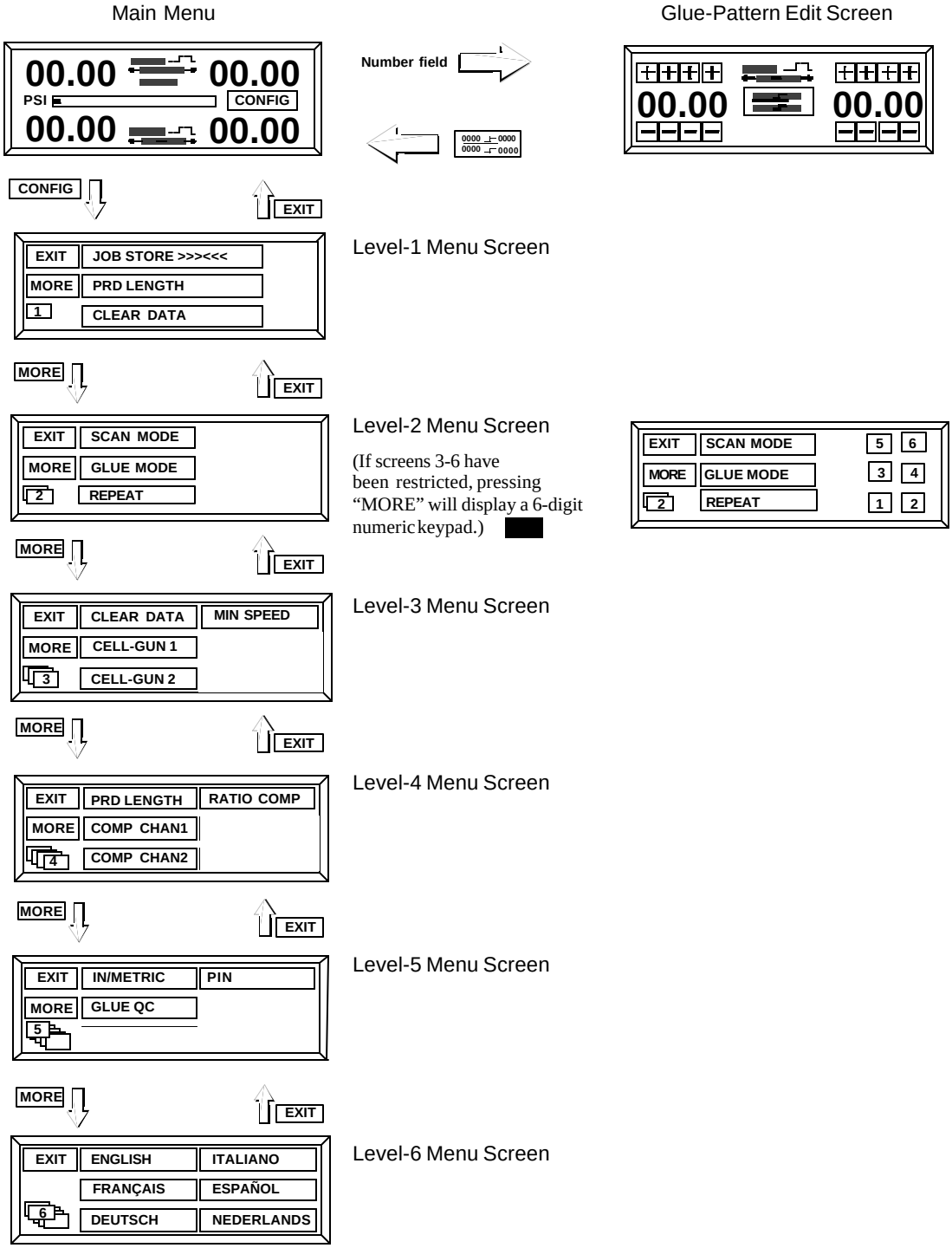


Figure 17. Main Menu Screen, Glue Pattern Edit Screen, and Level-1 through Level-6 Menu Screens

Main Screen

The main screen displays when power is supplied to the control (Figures 18 and 19). The features of the main screen are as follows:

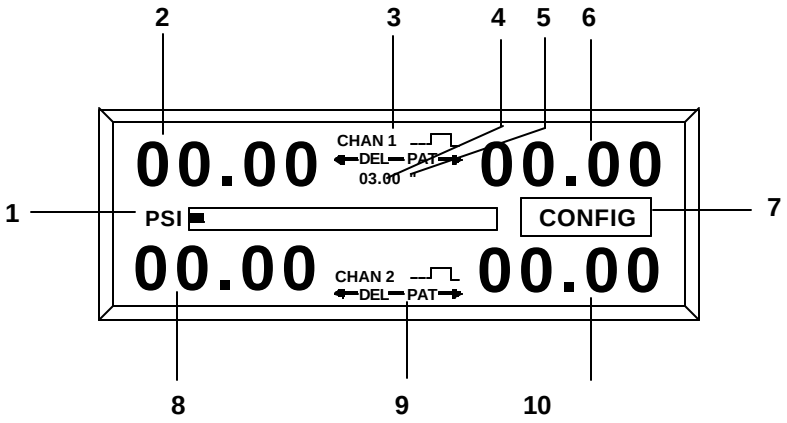


Figure 18. Example of a Control with the Glue Mode Set to "Delay Pattern"

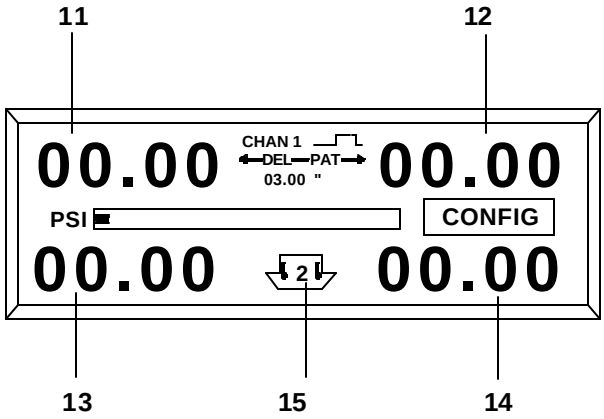


Figure 19. Example of a Control with the Glue Mode Set to "Delay Pattern Delay Pattern"

1 Glue pressure bar graph

This field displays the pressure supplied to the glue source. The pressure is displayed in either psi or bar, depending on the setup of the control.

2 Glue pattern delay (channel 1)

This field displays the distance from the leading edge of the product to the beginning of the glue pattern.

3 Channel 1 glue pattern edit

This field displays the channel assignment for the delay and pattern length settings seen on the left and right of this display.

4 Software version

This field displays the software version used by the control.

5 Inch or mm indicator

This field displays the measurement setup for the control. The inch symbol (") indicates imperial measurements and "mm" indicates metric measurements.

6 Glue pattern length (channel 1)

This field displays the length of the glue pattern.

7 Configuration

The level-1 menu screen displays when this button is pressed.

8 Glue pattern delay (channel 2)

This field displays the distance from the leading edge of the product to the beginning of the glue pattern.

9 Channel 2 glue pattern edit

This field displays the channel assignment for the delay and pattern length settings seen on the left and right of this display

10 Glue pattern length (channel 2)

This field displays the distance of the glue pattern.

Note! Items 11-15 pertain to the "delay pattern delay pattern" glue mode.

11 First glue pattern delay

This field displays the distance from leading edge of product to beginning of first glue pattern.

12 First glue pattern length

This field displays the distance of the glue pattern.

13 Second glue pattern delay

This field displays the distance from end of first glue pattern to beginning of second glue pattern.

14 Second glue pattern length

This field displays the distance of the second glue pattern.

15 Page down

Pressing this field displays pattern information for the next channel.

Glue-Pattern Edit Screen

The glue-pattern edit screen appears when any of the numbers on the main screen are pressed (Figure 18). The function of each button is as follows:

"**+**"—This button increases values for the pattern delay and length.

"**-**"—This button decreases values for the pattern delay and length.

Symbol in center of the screen—This button returns you to the main screen.

Note! The main screen will appear automatically if the parameters in the glue pattern edit screen have not been changed for ten seconds.

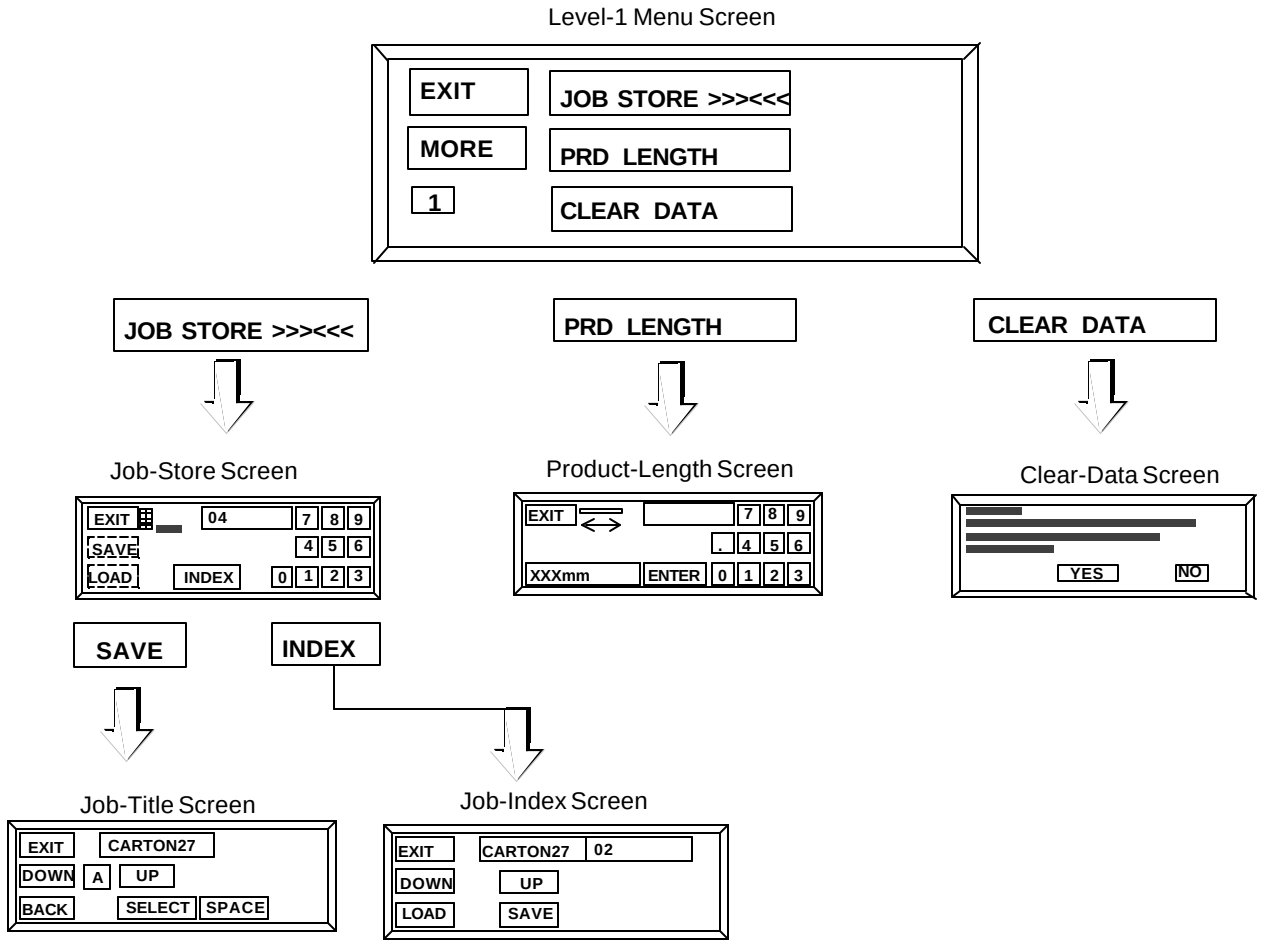


Figure 20. Level-1 Menu Screen and Associated Screens

Level-1 Menu Screen

The level-1 menu screen (Figure 20) displays when the "CONFIG" button on the main menu screen is pressed. The small box with the numeral 1 indicates that this is the level-1 menu screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the main screen.

MORE—Pressing this button displays the level-2 menu screen.

JOB STORE—Pressing this button displays the job store screen. The job store screen allows you to create a job name, save a job, and load a job.

PRD LENGTH—Pressing this button displays the product-length screen. The control uses the product-length value when calculating the ratio compensation in the automatic mode, detecting a product jam condition, and enabling the scanner lockout function to ignore holes in the product or dark areas such as printing.

CLEAR DATA—Pressing this button displays the clear-data screen. Pressing the "YES" button in the clear data screen erases the current job's delay and glue pattern length settings and returns the product length setting to zero. Pressing the "NO" button in the clear data screen returns you to the main screen without erasing any data.

The Job Store Screen

The job store screen (Figure 20) is used to assign job numbers. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-1 menu screen.

Numeric Keypad—You use the numeric keypad on the screen to enter a two-digit job number (all job parameters of the active job are saved when the job number is entered).

LOAD—This button displays only after the two-digit job number has been entered. Pressing the "LOAD" button loads the job.

SAVE—This button displays only after the two-digit job number has been entered. Pressing this button displays the job title screen, which allows you to assign a job name to the two-digit job number.

INDEX—Pressing this button displays the job index screen, which lists job names and numbers.

The Job Title Screen

The job title screen (Figure 20) displays when the "SAVE" button is pressed on the job store screen. The job title screen is used to assign a name (up to 10 characters) to the two-digit job number. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-1 menu screen.

A—This field displays the alphabet, numbers, and special characters.

DOWN—This button is used to scroll down through the alphabet, numbers, and special characters.

UP—This button is used to scroll up through the alphabet, numbers, and special characters.

BACK—Pressing this button moves the cursor backward in the job name field, erasing the displayed letters as it moves.

SELECT—Pressing this button enters the displayed letter into the job name field.

SPACE—Pressing this button adds a space to the job name.

The Job Index Screen

The job index screen (Figure 20) displays when the "INDEX" button is pressed on the job store screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the job store screen.

DOWN—Pressing this button allows you to scroll down the list of job names and numbers. ("01" is the lowest job number possible.)

UP—Pressing this button allows you to scroll up the list of job names and numbers. ("99" is the highest job number possible.)

LOAD—Pressing this button loads the job shown in the job name/number display.

SAVE—Pressing this button saves the active job to the name and number seen in the job name/number display (located above the "UP" button).

The Product Length Screen

The product-length (Figure 20) screen is used to specify product length. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-1 menu screen.

Numeric Keypad—The numeric keypad is used to type a product length.

ENTER—Pressing this button enters the product length.

The Clear-Data Screen

The clear-data screen (Figure 20) is used to clear the current job's data. The function of each button is as follows:

YES—Pressing the "YES" button erases the current job's delay and glue patterns.

NO—Pressing the "NO" button returns you to the level-1 menu screen without erasing any data.

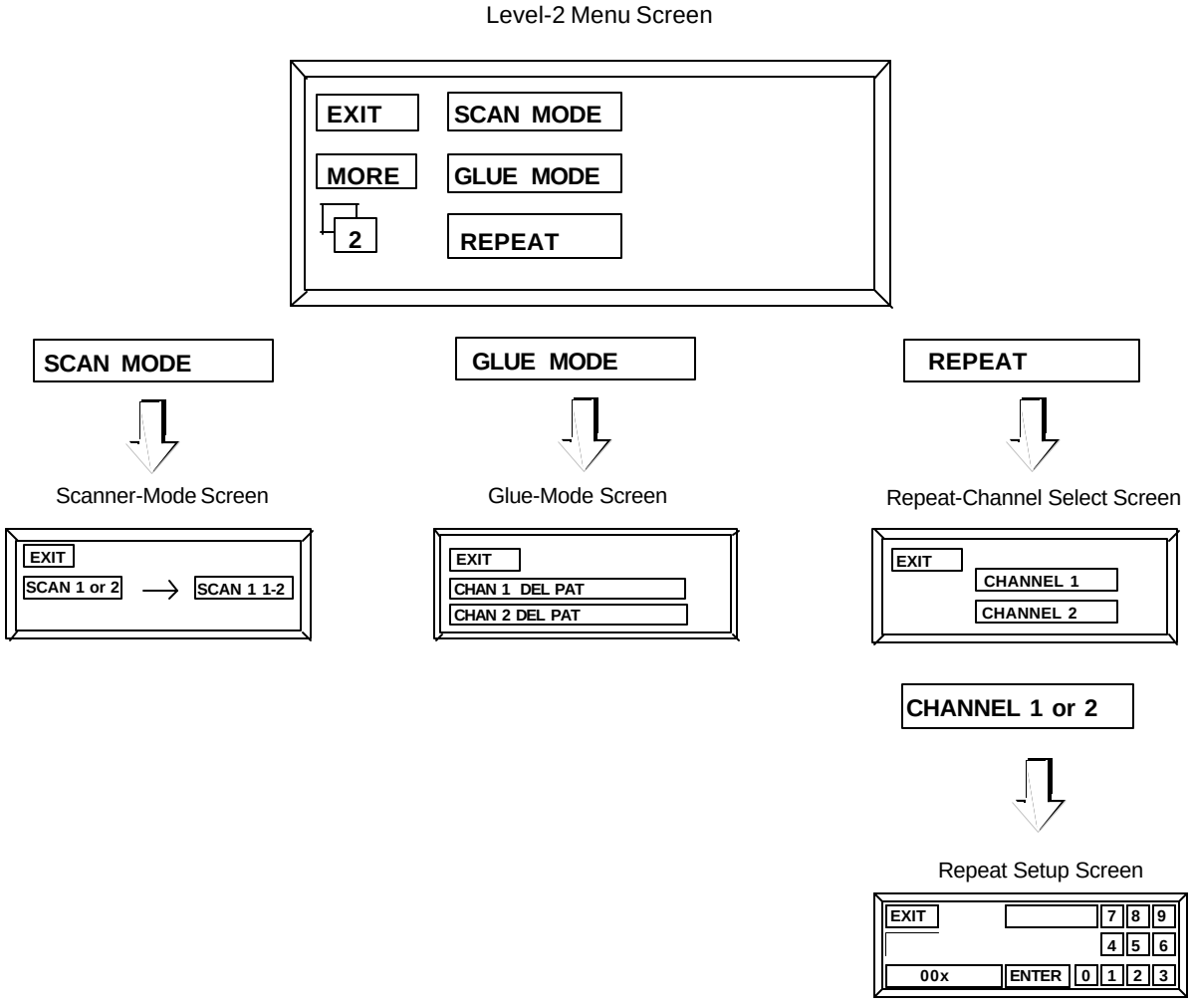


Figure 21. Level-2 Menu Screen and Associated Screens

Level-2 Menu Screen

The level-2 menu screen (Figure 21) displays when the "MORE" button on the level-1 menu screen is pressed. The small box with the numeral 2 indicates that this is the level-2 menu screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-1 menu screen.

MORE—Pressing this button advances you to the level-3 menu screen. (If screens 3-6 have been restricted, pressing this button displays a 6-digit numeric keypad, where you enter the PIN code.)

SCAN MODE—Pressing this button displays the scanner mode screen.

GLUE MODE—Pressing this button displays the glue mode screen, where you select a glue mode.

REPEAT—Pressing this button displays the repeat function screen.

The Scan-Mode Screen

The scan-mode screen (Figure 21) is used to select a scanner mode. The function of each button is:

EXIT—Pressing this button returns you to the level-2 menu screen.

SCAN 1 or 2—Pressing this button selects use of independent scanners for channels 1 and 2.

SCAN 1 1-2—Pressing this button selects use of a common scanner (scanner 1) for channels 1 and 2.

The Glue-Mode Screen

The glue-mode screen (Figure 21) is used to select a glue mode. The function of each button is:

EXIT—Pressing this button returns you to the level-2 menu screen.

CHAN 1 DEL PAT—Pressing this button selects either a single delay pattern (DEL PAT) or a dual delay pattern (DEL PAT DEL PAT) for channel 1.

CHAN 2 DEL PAT—Pressing this button selects either a single delay pattern (DEL PAT) or a dual delay pattern (DEL PAT DEL PAT) for channel 2.

The Repeat-Channel Select Screen

The repeat-channel select screen (Figure 21) is used to select the repeat-setup screen for channel 1 and/or channel 2. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-2 menu screen.

CHANNEL 1—Pressing this button displays the repeat-setup screen for channel 1.

CHANNEL 2—Pressing this button displays the repeat-setup screen for channel 2.

The Repeat-Setup Screen

The repeat-setup screen (Figure 21) is used to program the repeat function. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-2 menu screen.

Numeric Keypad—The numeric keypad is used to specify the number of repetitions.

ENTER—Pressing this button enters the number of repetitions.

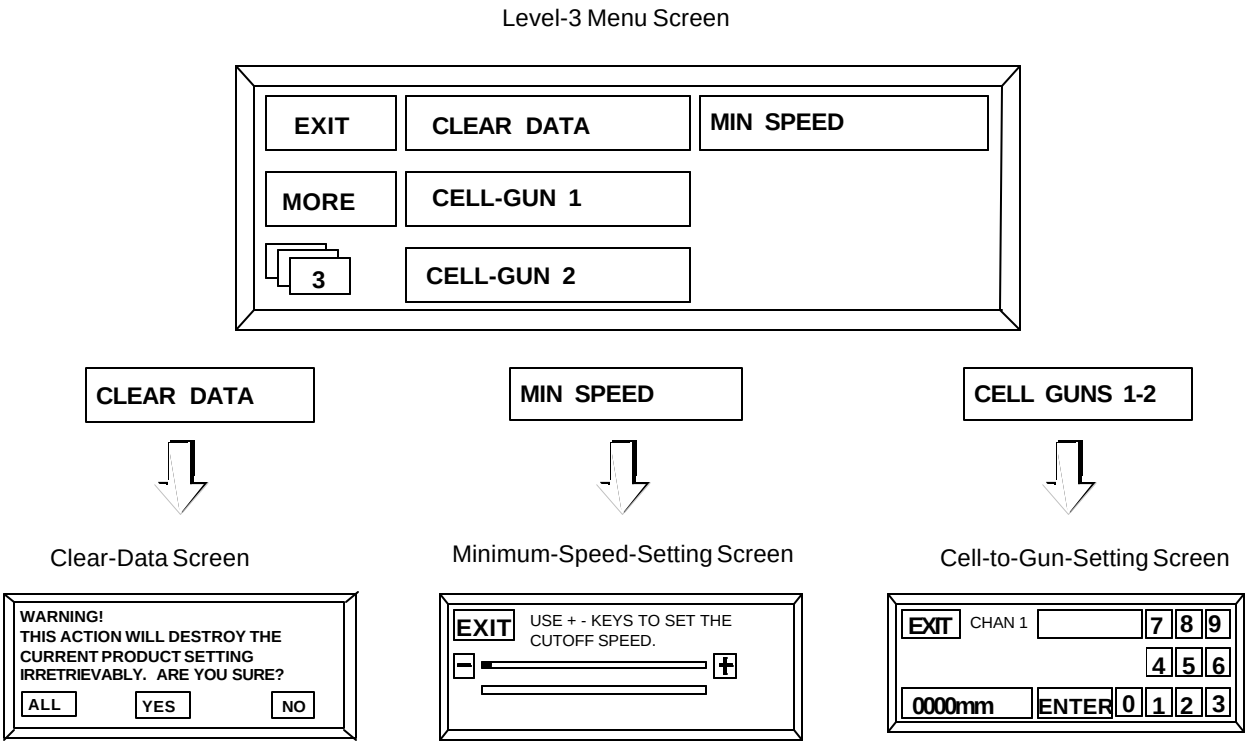


Figure 22. Level-3 Menu Screen and Associated Screens

Level-3 Menu Screen

The level-3 menu screen (Figure 22) displays when the "MORE" button on the level-2 menu screen is pressed. The small box with the numeral 3 indicates that this is the level-3 menu screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-2 menu screen.

MORE—Pressing this button advances you to the level-4 menu screen.

CLEAR DATA—Pressing this button displays the clear-data screen, which allows you to erase either the current job's data or all data.

MIN SPEED—Pressing this button displays the minimum speed setting screen, which allows you to specify the minimum gluing speed.

CELL-GUN (1-2)—Pressing either of the CELL-GUN buttons displays the cell-to-gun setting screen, which allows you to specify cell-to-gun dimensions.

The Clear-Data Screen

The clear-data screen is used to clear either all or partial data. The function of each button is as follows:

ALL—Pressing this button resets all parameters.

YES—Pressing this button erases the current job's delay and glue patterns.

NO—Pressing this button returns you to the level-3 menu screen without erasing any data.

The Minimum-Speed-Setting Screen

The minimum-speed-setting screen is used to specify the minimum gluing speed. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-3 menu screen.

The "-" key—Pressing the "-" key reduces the minimum speed.

The "+" key—Pressing the "+" key increases the minimum speed.

The Cell-to-Gun-Settting Screen

EXIT—Pressing this button returns you to the level-3 menu screen.

The numeric keyboard—The numeric keyboard is used to specify the distance between the channel scanner and the channel glue valve.

ENTER—Pressing this key enters the distance between the channel scanner and the channel glue valve.

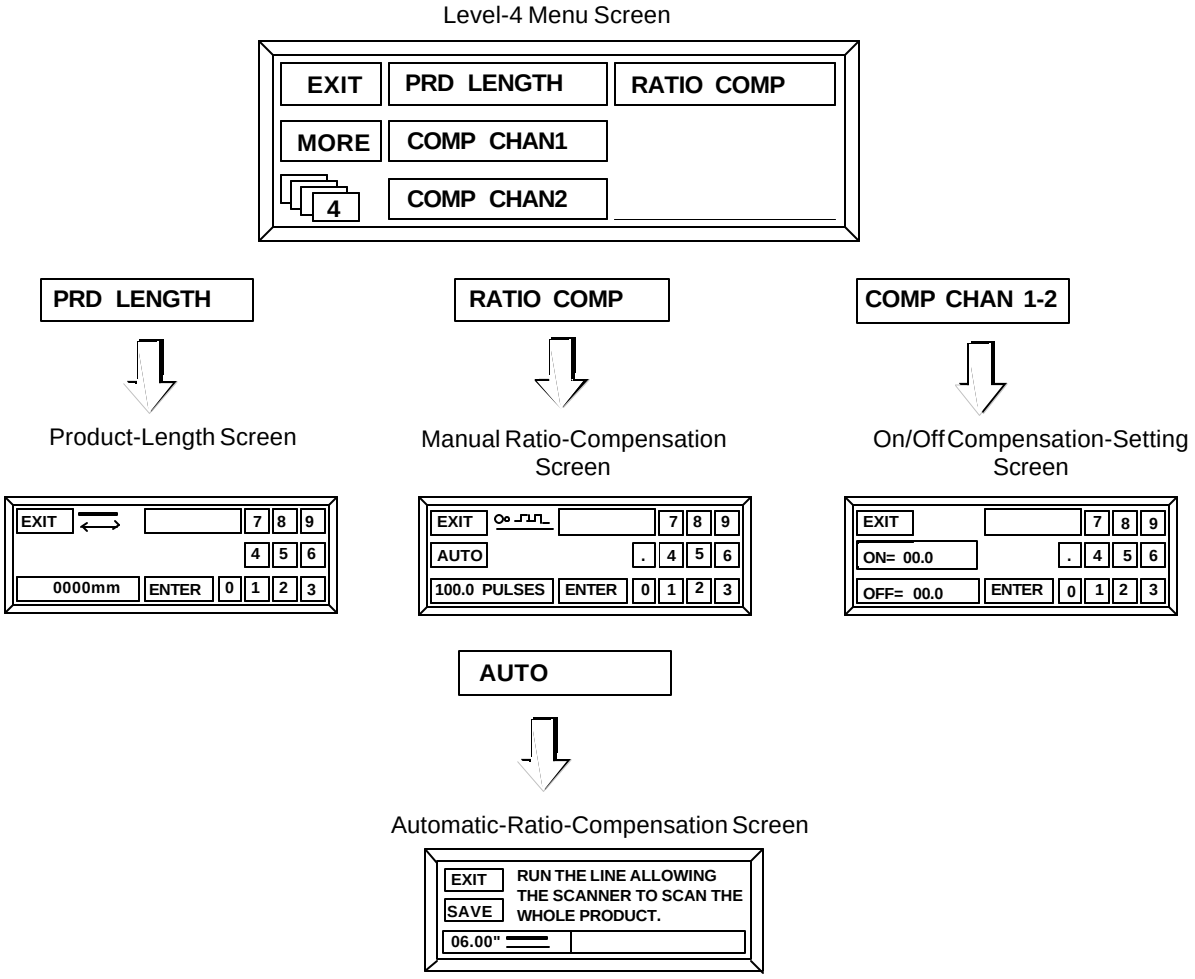


Figure 23. Level-4 Menu Screen and Associated Screens

Level-4 Menu Screen

The level-4 menu screen (Figure 23) displays when the "MORE" button on the level-3 menu screen is pressed. The small box with the numeral 4 indicates that this is the level-4 menu screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-3 menu screen.

MORE—Pressing this button advances you to the level-5 menu screen.

PRD LENGTH—Pressing this button displays the product-length screen. The control uses the product length value when calculating the ratio compensation in the auto mode, detecting a product jam condition and enabling the scanner lockout function to ignore holes in the product or dark areas such as printing.

RATIO COMP—Pressing this button displays the ratio compensation screen. Either a manual or automatic ratio compensation method may be used.

COMP CHAN (1-2)—Each channel (valve) has a separate compensation setting. Pressing either of the COMP CHAN buttons displays the compensation setting screen for that channel.

The Product-Length Screen

The product-length screen is used to specify product length. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-4 menu screen.

Numeric Keypad—The numeric keypad is used to specify the product length.

ENTER—Pressing this button enters the product length.

The Manual Ratio-Compensation Screen

The manual ratio-compensation screen is used to specify the product length. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-4 menu screen.

Numeric keypad—The numeric keypad is used to specify the number of encoder pulses per inch (25.4) mm) of product line travel.

ENTER—Pressing this button enters the number of encoder pulses per inch (25.4) mm) of product line travel.

AUTO—Pressing this button displays the automatic ratio compensation screen.

The Automatic-Ratio-Compensation Screen

The automatic-ratio-compensation screen displays when the "AUTO" button on the ratio-compensation screen is pressed. The automatic-ratio-compensation screen is used to specify the number of encoder pulses per inch (25.4 mm) of product line travel. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-4 menu screen.

SAVE—Pressing this button saves the new ratio compensation that is displayed at the bottom of the screen.

The On/Off Compensation-Setting Screen

The on/off compensation-setting screen displays when either the "COMP CHAN1" button or the "COMP CHAN2" button on the level-4 menu screen is pressed. The compensation-setting screen is used to specify the turn-on and turn-off times for the valves that are driven by each channel. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-4 menu screen.

ON=—Pressing this button allows the turn-on time to be specified.

OFF=—Pressing this button allows the turn-off time to be specified.

Numeric keypad—The numeric keypad is used to specify the turn-on/turn-off time for the channel that you have selected.

ENTER—Pressing this button enters the turn-on/turn-off time.

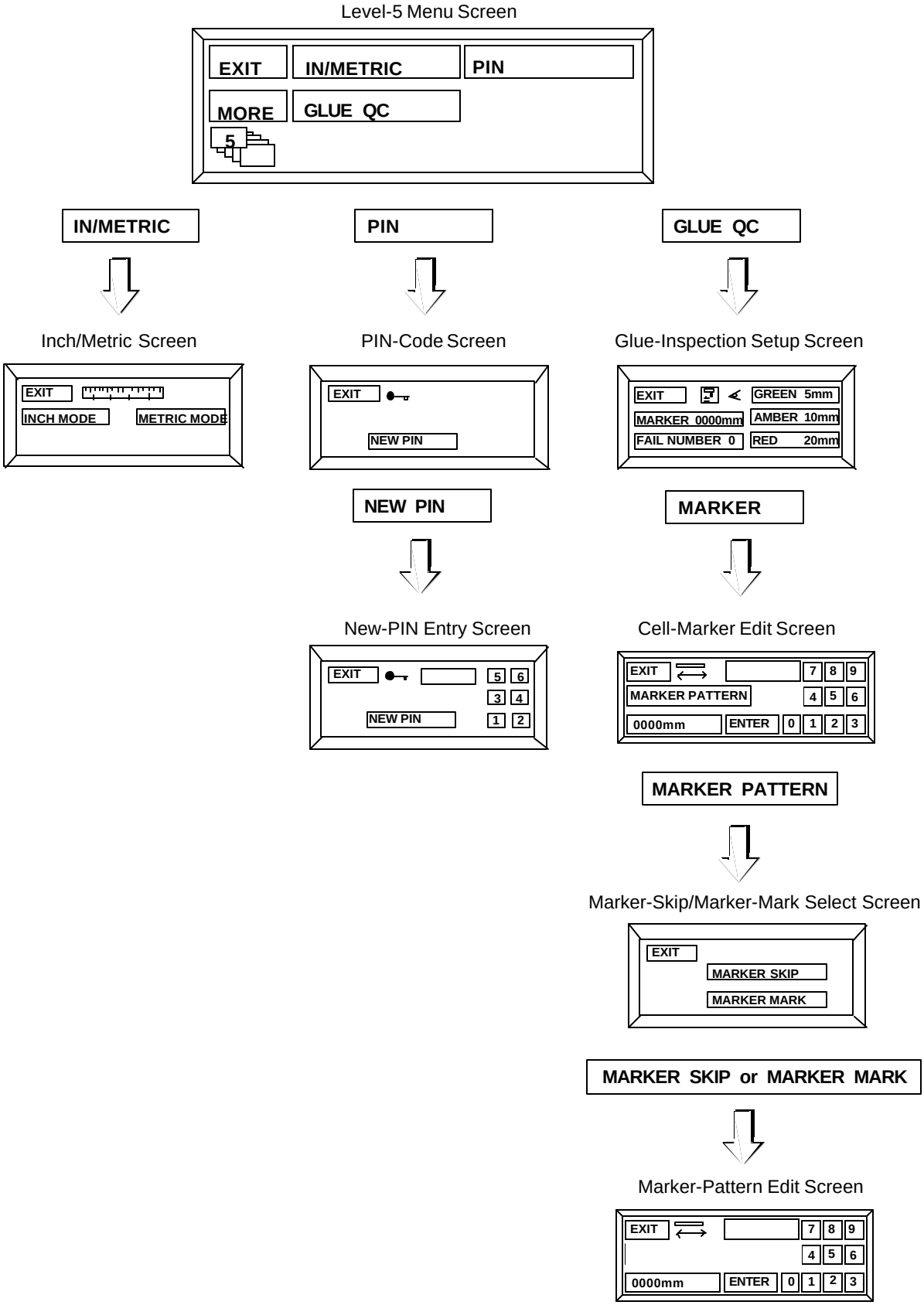


Figure 24. Level-5 Menu Screens and Related Screens

Level-5 Menu Screen

The level-5 menu screen (Figure 24) displays when the word "MORE" on the level-4 menu screen is pressed. The small box with the numeral 5 indicates that this is the level-5 menu screen. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-4 menu screen.

MORE—Pressing this button advances you to the level-6 menu screen.

IN/METRIC—Pressing this button displays the inch/metric screen. When "inch mode" is selected, all linear measurements are displayed and entered in inches, and pressure is displayed in pounds per square inch (psi). When "metric mode" is selected, all linear measurements are displayed and entered in millimeters, and pressure is displayed in "bar."

PIN—Pressing the "PIN" button displays the PIN-code screen. A four-digit PIN code may be entered in order to restrict access to menus 3-6.

GLUE QC—Pressing this button displays the glue inspection setup screen.

The Inch/Metric Screen

The inch/metric screen (Figure 24) is used to specify either inches or millimeters. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-5 menu screen.

INCH MODE—Pressing this button sets the control to imperial (inch and psi) measurements.

METRIC MODE—Pressing this button sets the control to metric (mm and bar) measurements.

The PIN Code Screen

The PIN code screen (Figure 24) is used to specify a PIN code in order to restrict screens 3-6. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-5 menu screen.

NEW PIN—Pressing this button displays a 6-digit numeric keypad, which you use to enter a new 4-digit PIN code.

The Glue Inspection Setup Screen

The glue inspection setup screen (Figure 24) is used to specify the allowable tolerance for glue inspection pass/fail decisions. The function of each button is as follows:

EXIT—Pressing this button returns you to the level-5 menu screen.

MARKER—Pressing this button displays the marker-edit screen.

FAIL NUMBER—Pressing this button increments the number of consecutive glue faults to cause a machine-stop condition. If the machine-stop relay is not wired to the parent machine, this parameter should be set to zero.

GREEN, AMBER, RED—Pressing one of these buttons selects the allowable tolerance for glue inspection pass/fail decisions.

Range-Select Button ( )—Pressing this button changes the tolerances of definitions for the "GREEN", "AMBER", and "RED" buttons.

The Cell-Marker Edit Screen

The marker-edit screen (Figure 24) is used to specify the distance from the product sensor (for glue inspection) to the marker. The function of each button is as follows:

EXIT—Pressing this button returns you to the glue inspection setup screen.

MARKER PATTERN—Pressing this button displays the marker-skip/marker-mark screen.

Numeric keyboard—The numeric keyboard is used to type the distance from the product sensor to the marker.

ENTER—Pressing this button enters the distance from the product sensor to the marker.

The Marker-Skip/Marker-Mark Select Screen

The marker-skip/marker-mark select screen (Figure 24) is used to select either the marker skip or the marker mark for editing. The function of each button is as follows:

EXIT—Pressing this button returns you to the marker-edit screen.

MARKER SKIP—Pressing this button displays the marker-pattern edit screen for the marker-skip distance.

MARKER MARK—Pressing this button displays the marker-pattern edit screen for the marker-mark distance.

The Marker-Pattern Edit Screen

The marker-pattern edit screen (Figure 24) is used to specify the pattern skip and mark distance on a faulty product. The function of each button is as follows:

EXIT—Pressing this button returns you to the marker-skip/marker mark select screen.

Numeric keyboard—The numeric keyboard is used to type the distance of either the marker skip or marker mark on a faulty product.

ENTER—Pressing this button enters the distance of either the marker skip or marker mark.

Level-6 Menu Screen

The level-6 menu screen (Figure 17) displays when the "MORE" button on the level-5 menu screen is pressed The small box with the numeral 6 indicates that this is the level-6 menu screen. The function of each button is as follows:

Language buttons—Pressing one of the language buttons causes that language to display on all of the screens, and returns you to the level-5 menu screen.

EXIT—Pressing the "EXIT" button returns you to the level-5 menu screen.

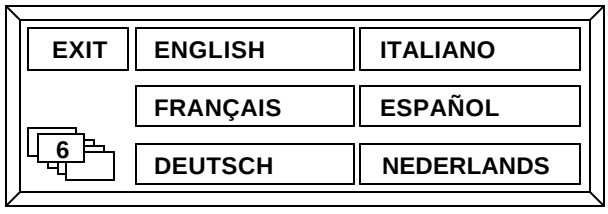


Figure 22. The Level-6 Menu Screen

Introduction

This section contains procedures for initial setup of the control. It may be helpful to refer to the flowcharts provided in the "Menus" section of this manual. The flowcharts are located as follows:

- Primary menu screens—Figure 17 (Page 30)
- Level-1 menu screen and associated screens—Figure 20 (Page 33)
- Level-2 menu screen and associated screens—Figure 21 (Page 35)
- Level-3 menu screen and associated screens—Figure 22 (Page 37)
- Level-4 menu screen and associated screens—Figure 23 (Page 39)
- Level-5 menu screen and associated screens—Figure 24 (Page 41)

Initial Setup

To conduct initial setup of the control, complete each of the following procedures.

Disable Glue Valves for All Channels

1. Place channel toggle switches in center position ("0") to prevent gluing during setup procedure.

Specify Inches or Millimeters

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "MORE" button in the level-1 menu screen.
3. Press the MORE button in menu screens 2, 3 and 4. The level-5 menu screen displays.
4. Press the "IN/METRIC" button. The inch/metric screen displays.
5. Press either the "INCH MODE" button or the "METRIC MODE" button. (The arrow points toward the mode that you have selected).

Note! When the "inch mode" is selected, all linear measurements are displayed and entered in inches, using four digits— two of which are decimal places (example: 10.00 = 10 inches). Pressure is displayed in pounds per square inch (psi). When the "metric mode" is selected, all linear measurements are displayed and entered in millimeters, using four digits (example: 1000 = 1000 millimeters). Pressure is displayed in "bar."

Note! Small errors (0.04 or 1mm) will result in parameters when switching between inch and metric modes.

6. Press the "EXIT" button to return to the level-5 menu screen.

Specify Minimum Gluing Speed

1. Begin operating the production line at the desired minimum speed (the speed at which gluing will begin).
2. Press the "MIN SPEED" button in the level-3 menu screen. The minimum-speed-setting screen displays.

Note! The minimum-speed-setting screen displays two bar graphs. The top bar graph displays the minimum speed of the parent machine at which gluing will begin. The bottom bar graph displays the actual speed of the parent machine. The maximum speed indication of the bar graph is 1000 feet (300 meters) per minute. If the parent machine exceeds this speed, the bar graph restarts from the left side and displays the speed above 1000 feet (300 meters) per minute.

3. Use the plus or minus buttons on the screen to adjust the upper bar graph (minimum speed) so that it is less than the lower bar graph (actual machine speed).
4. Press the "EXIT" button when done.

Set Cell-to-Gun Dimensions

1. Press the "CELL-GUN 1" button in the level-3 menu screen. The cell-to-gun setting screen displays.
2. Using the numeric keypad, enter the distance between the channel 1 scanner and the channel 1 glue valve (this value will display in either inches or millimeters depending on the setup of your control).

Note! Each channel (valve) has a separate cell-to-gun setting ("CELL-GUN 1" and "CELL-GUN 2").

3. Press the "ENTER" button. The "OK DONE" message displays, indicating that the distance entered has been saved.

Note! This value should need no adjustment after the initial installation of the control and valves. However, the setting should be checked if the valves or scanners are moved or changed.

4. Press the "EXIT" button to return to the level-3 menu screen.

Note! To set additional cell-to-gun dimensions, you repeat steps 4a. through 4d.

Specify Ratio Compensation

1. Press the "RATIO COMP" button in the level-4 menu screen.
2. Set the ratio compensation either manually or automatically (see procedures below).

Manual Ratio Compensation

To set ratio compensation manually, follow these steps:

1. Press the "RATIO COMP" button in the level-4 menu screen. The ratio compensation screen displays .
2. Using the numeric keyboard, input the number of encoder pulses per inch (25.4 mm) of product line travel.
3. Press the "ENTER" button. (The "OK DONE" message displays.)

Automatic Ratio Compensation

To set ratio compensation automatically, follow these steps:

Note! If using jam prevention, you must disable the stop circuit before using automatic ratio compensation. Otherwise, machine will shut down.

1. Press the "PRD LENGTH" button in the level-4 menu screen. The product length screen displays.
2. Using the numeric keypad, enter the exact product length.
3. Press the "ENTER" button. (The "OK DONE" message displays.)
4. Press the "EXIT" button to return to the level-4 menu screen
5. Press the "RATIO COMP" button in the level-4 menu screen. The ratio compensation screen displays.
6. Press the "AUTO" button. The automatic ratio compensation screen displays.
7. Run the line, allowing scanner 1 to scan the whole product.

Note! After the control has determined the number of encoder pulses per inch (25.4 mm) of product line travel, the value will be displayed in the automatic ratio compensation screen. Product length is seen on the left side of the screen and encoder pulses per inch (25.4 mm) of product travel are seen on the right side of the screen.

8. Press the "SAVE" button to accept the new ratio compensation setting.

Note! Automatic ratio compensation is used to determine a general ratio compensation to a resolution of several pulses.

9. Ensure that ratio compensation is accurate by measuring the length of a glue bead dispensed at low speed.
10. If necessary, use the manual ratio compensation to fine-tune the ratio compensation to a resolution of 0.1 pulse.
11. After the ratio compensation has been established, add 2 inches (50 mm) to the product length setting in order to allow the jam preventer and scanner lockout functions to operate correctly.

Specify On and Off Compensation

1. The channel compensation allows a turn-on and turn-off time to be entered for each glue valve. Press the "COMP CHAN1" button in the level-4 menu screen. The compensation setting screen displays.
2. Press the "ON=" button.
3. Using the numeric keypad, enter the manufacturer-specified "ON" compensation (turn-on time) in milliseconds for the channel 1 glue valve.

Note! If compensation value is not known, follow the "Unknown Compensation Value" procedure on the following page.

4. Press the "ENTER" button. (The turn-on time displays in the "ON=" window and the "OK DONE" message displays.)
5. Press the "OFF=" button.
6. Using the numeric keypad, enter the manufacturer-specified "OFF" compensation (turn-off time) in milliseconds for the channel 1 glue valve.

7. Press the "ENTER" button. (The turn-off time displays in the "OFF=" window and the "OK DONE" message displays.)

Note! To set compensation times for channel 2, you press the "COMP CHAN2" button and enter the turn-on and turn-off times as described above.

8. Press the "EXIT" button to return to the level-4 menu screen.

Unknown Compensation Value

When the compensation value is not known, follow these steps:

1. At the level-4 menu screen, set the channel's on and off compensation to 0 (see previous page).
2. Adjust the cell-to-gun dimension for the channel until the leading edge of the pattern is correct at low speed—that is, less than 75 feet (25m) per minute.
3. Increase machine speed to maximum.
4. Adjust the "ON" compensation until the leading edge of the pattern is correct. (Increasing the ON compensation will move the leading edge of the pattern forward at high speeds.)
5. Adjust the "OFF" compensation until the trailing edge of the pattern is correct. (Increasing the "OFF" compensation will move the trailing edge of the pattern forward at high speeds.)

Enable Glue QC

1. At the level-5 menu screen, press the "GLUE QC" button. The glue inspection setup screen displays.
2. Press the "MARKER" button. (The cell-marker edit screen displays.)
3. Using the numeric keypad, enter the distance from the first product scanner used for glue inspection to the marker valve or kicker/diverter.
4. Press the "ENTER" button. (The "OK DONE" message displays.)
5. Press the "MARKER PATTERN" button. (The marker skip/marker mark select screen displays.)
6. Press the "MARKER SKIP" button. (The marker-pattern edit screen displays.)
7. Using the numeric keyboard, enter the distance required on each faulty product before marking (a non-zero setting is required).
8. Press the "ENTER" button. (The "OK DONE" message displays.)
9. Press the "EXIT" button. (The marker skip/marker mark screen displays.)
10. Press the "MARKER MARK" button. (The marker-pattern edit screen displays.)
11. Using the numeric keyboard, enter the length of mark required on each faulty product (a non-zero setting is required).
12. Press the "ENTER" button. (The "OK DONE" message displays.)
13. Press the "EXIT" button. (The marker-skip/marker-mark select screen displays.)
14. Press the "EXIT" button again (the cell-marker edit screen displays.)
15. Press the "EXIT" once more (the glue inspection setup screen displays).

16. Press the "FAIL NUMBER" button to increase the number of consecutive glue inspection faults causing a machine stop. ***Each time you press this button, the number of faults is increased by 1.***

Note! If you accidentally press the button too many times, keep pressing it until the number you want comes up again.

Note! A zero in this field prevents the machine-stop relay from initiating a shutdown due to a glue fault. The maximum value is 9. If the machine-stop relay is not wired to the parent machine, the value in this field should be zero.

17. Press the range-select button to select a higher or lower set of tolerances for the "GREEN", "AMBER", and "RED" tolerance buttons.

18. Press one of the three tolerance buttons (GREEN, AMBER, or RED) to select the amount of error to be accepted for glue inspection. The toelrance indicator ("eye" symbol) displays next to the tolerance selected.

Note! The high range should be used for capacitive sensors. The low range can be used for most other sensors. The tolerances available in each range are:

Tolerance Button	Low Range	High Range
GREEN	5 mm	25 mm
AMBER	10 mm	40 mm
RED	20 mm	50 mm

Restrict Screen Access

To restrict access to screens 3–6, follow these steps:

1. In the level-5 menu screen, press the "PIN" button. The PIN-code screen displays.
2. Press the "NEW PIN" button. (A six-digit numeric keypad and a display window display.)

Note! If a PIN code has been previously entered, the new PIN code will overwrite the old PIN code—only one PIN code is possible.

3. Using the numeric keypad, enter a four-digit PIN code.

Screens 3–6 are now restricted. From now on, the six-digit numeric keypad will display when the "MORE" button is pressed in the level-2 menu screen. To proceed to additional menu levels (3-6), a user must enter the four-digit PIN code.

To provide non-restricted screen access, follow this step:

1. Press the "NEW PIN" button twice in order to delete the PIN code.

Return to the Main Screen

To return to the main menu screen, follow this step:

1. Press the "EXIT" button in the level-4, level-3, level-2, and level-1 menu screens.

Operation

Introduction

This section contains procedures for operating the control. It may be helpful to refer to the flowcharts provided in the "Menus" section of this manual. The flowcharts are located as follows:

- Primary menu screens—Figure 17 (Page 30)
- Level-1 menu screen and associated screens—Figure 20 (Page 33)
- Level-2 menu screen and associated screens—Figure 21 (Page 35)
- Level-3 menu screen and associated screens—Figure 22 (Page 37)
- Level-4 menu screen and associated screens—Figure 23 (Page 39)
- Level-5 menu screen and associated screens—Figure 24 (Page 41)

Creating a Job

To create a job, follow these steps:

1. Specify the scanner mode (see Page 53).
2. Specify the glue mode (see Page 54).

Note! If the repeat function will be used, see Appendix A.

3. Specify the delay and pattern values (see Page 54).
4. Specify product length (see Page 55).
5. Enable the glue valves:

   5a. Place the toggle switches for the desired channels in the enabled position ("|").

6. Conduct a low-speed check:

   6a. Operate the parent machine at low speed.

   6b. Observe the glue pattern on the product.

   Note! Gluing does not begin until the parent machine is operating at the minimum threshold speed set in the control. It may be necessary to adjust the minimum speed to apply glue at low speed.

   6c. Adjust the values for delay and pattern if necessary.

7. Conduct a high-speed check:

   7a. Operate the parent machine at the maximum production speed.

   7b. Observe the glue pattern on the product. If the glue pattern is not accurately applied at high speed, follow the channel compensation procedure in the "Initial Setup" section.

8. Adjust the glue pressure:

   8a. Use the front-panel glue pressure switch to increase ("+") or decrease ("-") the pattern's glue volume (air pressure) if necessary.

   Note! The amount of pressure selected is indicated by the linear bar graph in the center of the screen and by a pressure gauge located underneath the control.

Saving a Job

To save a job for future recall, follow these steps:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "JOB STORE" button. (The job-store screen displays.)
3. Perform one of the following actions (3a or 3b):

   3a. Enter a two-digit job number (01–99) and then press the "SAVE" button.

   3b. Press the "INDEX" button (the job index screen displays). Press the "UP" and "DOWN" buttons to locate an empty job number location (10 dots in the display field to the left of the number indicate an empty location). When an empty job number location has been found, press the "SAVE" button.

   Note! If the location already contains a job, the "WARNING! THIS STORE CONTAINS DATA. DO YOU WISH TO CONTINUE?" message displays. Pressing the "YES" button overwrites the location with the new job information. (The job title screen displays.) Pressing the "NO" button returns you to the job index screen, where you can select a different location.

   Note! The job title screen displays after completing either of the actions in step 3.

4. In the job title screen, use the "DOWN" and "UP" buttons to select a letter.
5. Press the "SELECT" button to enter the letter into the display. (The cursor will automatically move to the right.)
6. Select additional letters until you have entered the job name.

Note! To erase letters, you press the "BACK" button. To add a space between letters, you press the "SPACE" button.

7. Press the "EXIT" button (the level-1 menu screen displays).
8. Press the "EXIT" button again (the main-menu screen displays).

Loading a Job

To load a job that has previously been saved:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "JOB STORE" button (The job store screen displays.)
3. Perform one of the following actions (3a or 3b):

   3a. Enter a job number and then press the "LOAD" button.

   3b. Press the "INDEX" button to display the stored jobs (the job index screen displays). Press the "UP" or "DOWN" buttons to locate the desired job name and number. When the desired job name and number location have been found, press the "LOAD" button to initiate the loading process. Press the "EXIT" button. (The job store screen displays.)

   Note! After completing either step 3a or step 3b, the "LOADED" message appears in the job number display. The job that was selected is now the active gluing program.

4. Press the "EXIT" button. (The level-1 menu screen displays.)
5. Press the "EXIT" button again. (The main-menu screen displays.)

Repeating Glue Patterns

For information on how to repeat glue patterns, see Appendix A.

Clearing Data

Both the level-1 menu screen and the level-3 menu screen have "CLEAR DATA" buttons. However, the "CLEAR DATA" button in the level-3 menu screen has the capability of erasing all data, and the "CLEAR DATA'' button in the level-1 menu screen is capable of clearing data only for the current job.

To clear data, follow these steps:

1. In the level-3 menu screen, press the "CLEAR DATA" button. (The clear-data warning screen displays.)
2. Press one of the three buttons described in 2a., 2b., and 2c.:

   2a. Pressing the "YES" button erases the current job's delay and glue patterns and returns the product-length setting to zero.

   Note! Once you press the "YES" button, the data is erased and cannot be retrieved.

   2b. Pressing the "NO" button returns you to either the level-1 or the level-3 menu screen without erasing any data.

   2c. Pressing the "ALL" button resets the following parameters (level-3 menu screen only):

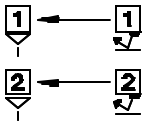
   - Delay and pattern lengths in jobs 1-99 will be erased.
   - Product length = 0
   - Scan mode (2-channel model only) = SCAN 1 or 2
   - Glue mode = DEL PAT
   - Minimum speed = 0
   - Cell-to-gun = 0
   - Ratio compensation = 100
   - Compensation channels 1-4 = 0
   - In/metric = metric
   - Pin code access = deactivated
   - Language = English

   Note! Once you press the "ALL" button, the data is erased and cannot be retrieved.

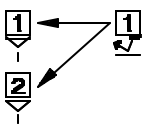
Specifying the Scanner Mode

Two scanner modes are available for the control:

- ***SCAN 1 or 2***—Scanner 1 is used to scan product for channel 1. Scanner 2 is used to scan product for channel 2.



- ***SCAN 1 1-2***—Scanner 1 is used to scan product for both channel 1 and channel 2.



To specify the scanner mode, follow these steps:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "MORE" button. (The level-2 menu screen displays.)
3. Press the "SCAN MODE" button in the level-2 menu screen. (The scan-mode screen displays.)
4. Choose a scan mode by pressing the appropriate scan mode button.

Note! The arrow between the two buttons points to the scan mode that is currently selected.

5. Press the "EXIT" button to return to the level-2 menu screen.

For additional scanner configurations, see Appendix C.

Specifying the Glue Mode

With a two-channel control, two glue modes are possible:

- "DEL PAT"—In this mode, a single delay (or skip) dimension and a single pattern dimension are displayed on the main screen. When both channels are in this mode, a single main screen displays the delay and pattern dimensions for channel 1 across the top of the main screen and dimensions for channel 2 across the bottom of the main screen.
- "DEL PAT DEL PAT"—In this mode, a single delay (or skip) dimension and a single pattern dimension are displayed across the top of the main screen, and a second pair of delay and pattern dimensions are displayed across the bottom of the main screen. When either or both channels are in this mode, multiple main screens display the delay and pattern dimensions for a single channel only.

To select the glue mode, follow these steps:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "MORE" button. (The level-2 menu screen displays.)
3. Press the "GLUE MODE" button. (The glue-mode screen displays.)

Note! Each of the two channel buttons (CHAN 1 and CHAN 2) toggles between DEL PAT and DEL PAT DEL PAT.

4. Press the "CHAN 1" button to set the channel 1 glue mode to either "DEL PAT DEL PAT" or "DEL PAT".
5. Press the "CHAN 2" button to set the channel 2 glue mode to either "DEL PAT DEL PAT" or "DEL PAT".
6. Press the "EXIT" button to return to the level-2 menu screen.

Specifying the Delay and Pattern Values

To specify delay and pattern values, follow these steps:

1. At the main-menu screeen, press any of the number fields for channel 1 (Figure 25). The glue pattern edit screen displays.

Note! You use the plus and minus buttons on the glue pattern edit screen to enter values for the delay and for the glue pattern. The delay fields are located on the left side of the screen and the glue pattern fields are located on the right side of the screen.

2. At the first glue pattern delay field, enter the distance from the leading edge of product to the beginning of the first glue pattern. This distance will be entered in either inches (01.00 = 1 inch) or millimeters depending on the setup of your control.
3. At the first glue pattern length field, enter the length of the glue pattern. This distance will be entered in either inches (01.00 = 1 inch) or millimeters depending on the setup of your control.

Note! A minimum of 00.01" or 0001 mm must be entered for the delay setting to activate the channel.

4. At the second glue pattern delay field, enter the distance from the end of the first glue pattern to the beginning of the second glue pattern.
5. At the second glue pattern length field, enter the length of the second glue pattern.
6. Press the "PAGE DOWN" button to see pattern information for the next channel.
7. Repeat steps 1 through 6 for channel 2.

Specifying the Product Length

A non-zero value for the product length enables the jam detection and scanner lockout functions. The value entered should be approximately 2 inches (50 mm) longer than the actual product. To specify the product length, follow these steps:

1. Press the "CONFIG" button on the main screen. (The level-1 menu screen displays.)
2. Press the "PRD LENGTH" button. (The product-length screen displays.)
3. Using the numeric keypad, input the length of the product plus two inches (50 mm).
4. Press the "ENTER" button. (The "OK DONE" message displays.)
5. Press the "EXIT" button to return to the level-1 menu screen.

Glue Pattern Example:

Scanner mode	=	"SCAN 1 1-2"
Glue mode	=	"DEL PAT DEL PAT"
Inch/metric	=	Metric

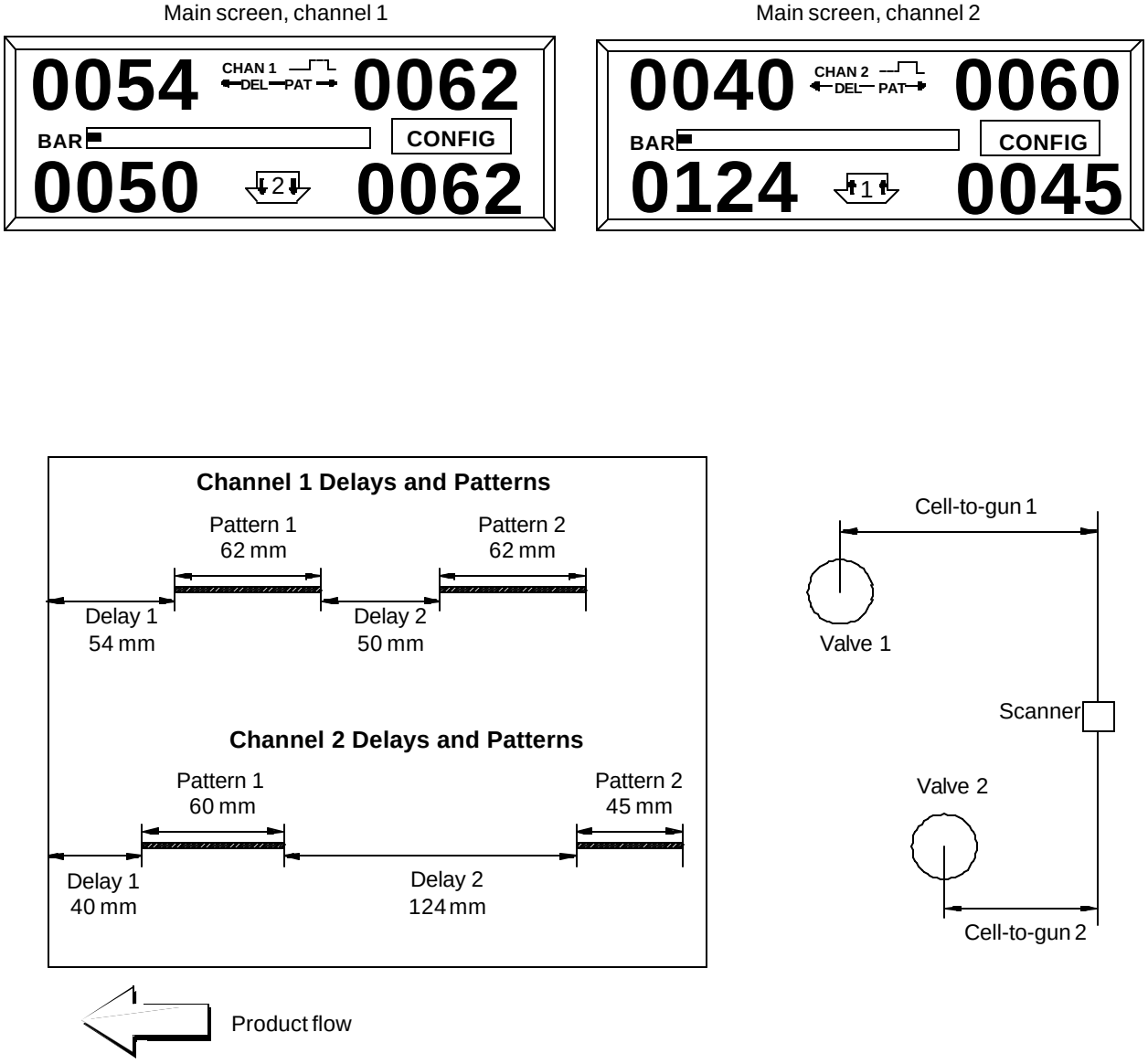


Figure 25. Glue Pattern Example

Introduction

This section contains possible solutions to problems that you may experience.

Problem	Possible Solution
Power	
1. Front panel lights and touchscreen do not illuminate.	1a. Check fuses in the power entry module (bottom panel). 1b. Check that the proper voltage shows through the fuse door of the power entry module. 1c. Check that the on/off switch is in the on ("|") position. 1d. Replace power supply board.
2. Lights illuminate but the touchscreen is dark.	2a. Check the "F1" fuse on the power supply board. 2b. Replace power supply board 2c. Replace touchscreen.
3. 12V input voltage front-panel indicator does not illuminate.	3a. Check the "F1" and "F2" fuses on the power supply board 3b. Replace power supply board.
4. 5V logic voltage front-panel indicator does not illuminate.	4a. Check the "F1" fuse on the power supply board. 4b. Replace power supply board.
Scanner	
1. Front-panel scanner indicator does not illuminate when a product is in the scanner's detection field.	1a. Check the distance between the scanner and the product (see the Installation section of this manual). 1b. Ensure that the scanner cable is connected at the scanner and at the control. 1c. Check for damage to the scanner cable. 1d. Check the "F2" fuse on the power supply board.
2. Front-panel scanner indicator does not turn off.	2a. Ensure that the scanner is not too close to a machine element.

Problem	Possible Solution
Encoder	
1. Front-panel encoder indicator does not illuminate when the product line is moving.	1a. Ensure that the encoder's measuring wheel is securely against the parent machine surface and does not slip during operation. 1b Check the "F2" fuse on the power supply board. 1c. Check for damage to the encoder cable. 1d. Replace encoder.
2. "X/MIN" (greater than minimum speed) front-panel indicator does not illuminate.	2a. The minimum speed setting is too high.
Glue Valve	
1. The lower portion of the channel valve indicator does not illuminate.	1a. Check the delay ("DEL") and pattern ("PAT") settings. (A delay of at least "00.01" inches or "0001" millimeters must be entered in order to activate the channel.) 1b. Check that the channel toggle switch on the front panel is in the enabled ("1") position.
2. Glue valve does not dispense glue.	2a. Check the delay ("DEL") and pattern ("PAT") settings. (A delay of at least "00.01" inches or "0001" millimeters must be entered in order to activate the channel.) 2b. Check that the channel toggle switch on the front panel is in the enabled ("1") position. 2c. Check that the line speed is above the minimum speed setting. 2d. Check for a clogged glue valve. 2e. Check for damage to the glue valve's cable. 2f. Check the "F1", "F2", and "F3" fuses on the valve driver board. 2g Replace valve driver board.
Glue Pattern	
1. At low speed, the delay is too short or too long before the pattern starts.	1a. Ensure that the delay value has been correctly entered. 1b. Ensure that the product length has been correctly entered. 1c. Ensure that the ratio compensation has been correctly entered. 1d. Ensure that the cell-to-gun value has been correctly entered.
2. At low speed, the pattern length is too short or too long.	2a. Ensure that the pattern value has been correctly entered. 2b. Ensure that the product length has been correctly entered. 2c. Ensure that the ratio compensation has been correctly entered.

Problem	Possible Solution
Glue Pattern, continued	
3. At high speed, the delay is too short or too long before the pattern begins.	3a. Ensure that the delay value has been correctly entered. 3b. Ensure that the delay is correct at low speed. 3c. Ensure that the turn-on compensation has been correctly entered.
4. At high speed, the pattern length is too short or too long.	4a. Ensure that the pattern value has been correctly entered. 4b. Ensure that the pattern length is correct at low speed. 4c. Ensure that the turn-off compensation has been correctly entered.
Glue Inspection	
1. Intermittent, rapid flahing of the PASS light.	1. Ensure that the glue-QC tolerance doubled is not greater than the glue pattern length specified. 2. Ensure that the glue-QC tolerance is not greater than the delay length specified.

Introduction

This section contains descriptions of the controls's internal components (Figure 26).

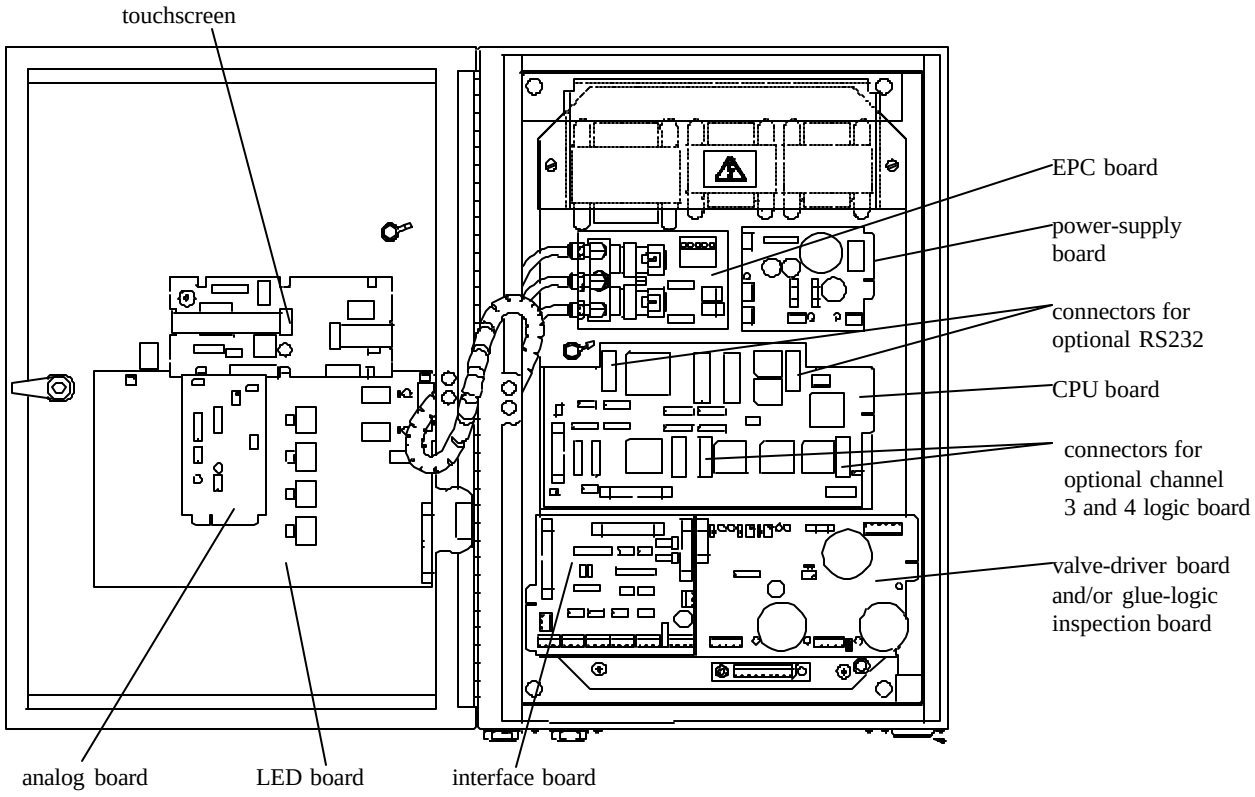


Figure 26. Internal Components of the VC3700

CPU Board

PN 151xx362

Connectors	
J1, J2	Connection for the optional RS232 daughter board
J3	Connection to LCD/touchscreen module via a 20-pin ribbon cable
J4	Connection to glue inspection board
J5, J6	Connection for the optional channel 3 and 4 logic daughter board.
J7 (not used)	In early models, connection to LED board to deliver analog pressure feedback signal to CPU
J8	Connection to interface board via a 26-pin ribbon cable
J9	Connection for 17VDC supply voltage from the power supply board
Indicators	
D1 (Reset)	When lit, this red LED indicates that the main processor (68000) is being given a hardware reset.
Jumpers	
2/4 Channel Select	A wire jumper near the center of the board determines whether two-channel or four-channel software is utilized: • Installed—A jumper installed dictates that two-channel software is use. • Not installed—No jumper dictates that four-channel software is used.
Switches	
A pushbutton near the upper left corner provides a manual reset function.	
Test Points	
TP1 (CLOCK)	8 MHz, 5V digital clock signal from Oscillator U7 for main processor U1.
TP2 (CNTR-CLK)	5V encoder signal gated by a timer from U17 (68230, PB6). These gated encoder pulses are counted by U9 (74HCT293). Periodically, the 68000 main processor queries this binary count through port lines PA0 through PA7 of U17. The 68000 main processor then calculates line speed from knowing the number of encoder pulses in a given time period.
TP4 (PRESSURE)	This analog signal (0 to 5VDC) represents the air pressure sensed by the EPC-6.
TP3 (MIN SPEED)	This signal will be low when the line speed is Greater than minimum speed. This signal will be high when the line speed is Lower than minimum speed.
TP5 (+5V)	Small pad located near lower right corner of board.
TP6 (GND)	A U-shaped pad on the right edge provides the reference for all logic signals.

Channels 3 and 4 Logic Board

PN 151xx363

Connectors	
J5, J6	Connection to the CPU board

Analog Board

PN 151xx364

Connectors	
J1, J2	Connection to the LED board
Jumpers	
JP1	**Low Pressure Limit Select** A low air-pressure limit may be selected for delivery to glue source. Normally, this is set to 0%. Other possible selections are 10, 25, and 50% of full pressure.
Potentiometers	
P1 (Bar 0-Adj)	Allows adjustment of the pressure bar graph on the LCD/touchscreen to a minimal length for zero speed.
P2 (Gain Adj)	Not used. In early models, allowed adjustment to gain of frequency-to-voltage converter U3. Increasing the gain will increase the analog voltage at J2, pin 3 (to the EPC) for a given frequency of encoder pulses.

LED Board

PN 151xx406

Connectors	
CO1	Connection to interface board and glue-inspection board via a 40-pin ribbon cable. This cable is split, with the first ten conductors going to the glue-inspection board.
J2	Connection for 17VDC supply voltage from the power supply board
J3, J4	Connection to analog daughter board
J5	Connection to EPC via a four-conductor cable
J6, J7	Connection for front-panel channels 1 and 2 enable switches
J10	Connection for front-panel pressure-adjust switch

Interface Board

PN 151xx366

Connectors	
CO1	Connection to LED board via a 30-pin ribbon cable
CO2	Connection to CPU board via a 26-pin ribbon cable
CO3	Connection to valve driver board(s) via a 20-pin ribbon cable
J1, J2, J3, J4	Connection for product scanners
J5	Connection for encoder
J6	Connection for machine interface board for machine-stop relay
J7	Connection for 17VDC supply voltage from power supply board
J8	Connection for dump-valve (glue by-pass valve)
Replacement Fuses	
12 VDC I/O Supply	Label—F1 Type—PC Mount Value—1.5A Valco Number—085xx132
Dump Valve Active	Label—F2 Type—PC Mount Value—1.5A Valco Number—085xx132
Indicators	
D1 (12 V)	When lit, this green LED indicates that the 12VDC supply for scanners, encoder, and by-pass valve (dump valve) is operational.
D2	When lit, this yellow LED indicates that the bypass valve is activated and that the parent machine is above minimum speed.
Jumpers	
JP1 and JP2	**Valve Driver Type** Pins 1 and 2 jumpered—Use of valve driver board Pins 2 and 3 jumpered—Future use

Valve Driver Board

PN 151xx367

Connectors	
J1	Connection to interface board via a 10-pin ribbon cable
J2	Connection for transformer secondary voltages to form the 56VDC peak voltage and the 12VDC hold voltage
J3	Connection for the first glue valve on this card
J4	Connection for the second glue valve on this card
Indicators	
D1 (IN1)	When lit, this yellow LED indicates that an input signal has been received from the Interface board to energize glue valve 1.
D2 (IN2)	When lit, this yellow LED indicates that an input signal has been received from the interface board to energize glue valve 2.
D3 (12 V)	When lit, this green LED indicates that the 12VDC hold voltage is available to energize a glue valve.
D4 (15 V)	When lit, this green LED indicates that 15VDC input to regulator U3 is present.
D5 (56 V)	When lit, this green LED indicates that the 56VDC peak voltage is available to energize a glue valve.
D6 (HOLD-1)	When lit, this yellow LED indicates that the 12VDC hold voltage is applied to glue valve 1.
D7 (PEAK-1)	When lit, this yellow LED indicates that the 56VDC peak voltage is applied to glue valve 1.
D8 (HOLD-2)	When lit, this yellow LED indicates that the 12VDC hold voltage is applied to glue valve 2.
D9 (PEAK-2)	When lit, this yellow LED indicates that the 56VDC peak voltage is applied to glue valve 2.
D10 (Fault F2)	When lit, this red LED indicates a fault with fuse F2.
D11 (Fault F3)	When lit, this red LED indicates a fault with fuse F3.
Replacement Fuses	
Hold Voltage current limit	Label—F1 Type—5 x 20 mm Value—5A Valco Number—085xx206
Channel 1 current limit	Label—F2 Type—PC Mount Value—5A Valco Number—085xx216
Channel 2 current limit	Label—F3 Type—PC Mount Value—5A Valco Number—085xx216

Jumpers	
JP1	**Common/Independent Output Control** Pins 1 and 2 jumpered—Causes both outputs to be controlled from channel 1 program parameters. Pins 2 and 3 jumpered—Allows outputs to be controlled independently
JP2	**Fixed/Variable Peak Voltage duration for Channel 1** Pins 1 and 2 jumpered—Forces a fixed peak voltage duration of 3.5mS for channel 1. Pins 2 and 3 jumpered—Allow adjustment of peak voltage duration of 1mS to 10mS for channel 1 using potentiometer P1.
JP3	**Fixed/Variable Peak Voltage duration for Channel 2** Pins 1 and 2 jumpered—Forces a fixed-peak voltage duration of 3.5mS for channel 2. Pins 2 and 3 jumpered—Allows adjustment of peak voltage duration of 1mS to 10mS for channel 2 using potentiometer P2.
JP4	**Fixed/Variable Hold Voltage level** Pins 1 and 2 jumpered—Forces a fixed-hold voltage level of 12V. Pins 2 and 3 jumpered—Allows adjustment of hold voltage level of 5V to 12V using potentiometer P3.
Potentiometers	
P1 (PTIME1)	Provides adjustment between 1mS and 12mS for channel 1 peak voltage duration when JP2 has a jumper between pins 2 and 3. Clockwise rotation increases duration.
P2 (PTIME2)	Provides adjustment between 1mS and 12mS for channel 2 peak voltage duration when JP3 has a jumper between pins 2 and 3. Clockwise rotation increases duration.
P3 (HOLDV)	Provides adjustment between 2V and 13V for hold voltage level when JP4 has a jumper between pins 2 and 3. Clockwise rotation increases hold voltage level.

Power Supply Board

PN 151xx368

Connectors	
J1	Connection for transformer secondary voltages to form the DC logic voltages used on other boards.
J2	Connection to supply the 12VDC supply voltage to the LCD/touchscreen's LED backlight
J3	Connection to supply the 17VDC supply voltage to the LED board
J4	Connection to supply the 17VDC supply voltage to the CPU board
J5	Connection to supply the 17VDC supply voltage to the interface board
J7	Connection to supply the 32VDC supply voltage to DD-1 pump

Replacement Fuses	
CPU/LED current limit	Label—F1 Type—5 x 20 mm Value—3.15A Valco Number—085xx208
I/O current limit	Label—F2 Type—5 x 20 mm Value—1.6A Valco Number—085xx209
DD-1 pump current limit	Label—F3 Type—5 x 20 mm Value—1.6A Valco Number—085xx209
Indicators	
D1 (LCD supply)	When lit, this green LED indicates that the 12VDC supply voltage is available to light the LED backlight.
D2 (Logic supply)	When lit, this green LED indicates that the 17VDC supply voltage is available to power the CPU board
D3 (Intrfc supply)	When lit, this green LED indicates that the 17VDC supply voltage is available to power the interface board.
D4 (Pump supply)	When lit, this green LED indicates that the 32VDC supply voltage is available to power the DD-1 pump.

RS232 Board

PN 151xx375

Connectors	
J1, J2	Connection to the CPU board
J3	Connection for serial port via ribbon cable
Jumpers	
JP1	Hardware/software handshaking: Pins 2 and 3 jumpered—Normal configuration (software handshaking, CTS and RTS connected) Pins 1 and 2, 3, & 4 jumpered—Not used (hardware handshaking)
JP2, JP3	Cable-type selection Pins 1 and 2 jumpered—Normal configuration (DB9 to DB9 null modem cable) Pins 2 and 3 jumpered—DB9 to DB25 and special cables **Note!** P2 and JP3 must be jumpered in the same manner.

EPC Board

PN 151xx379

Connectors	
J1	Connection for 12VDC power supply, input analog signal, intake output signal, and exhaust/sensor output signal
Indicators	
CR1 (12 V supply)	When lit, this green LED indicates that the 12VDC supply voltage is available.
CR2 (Intake)	When lit, this yellow LED indicates that the Intake solenoid is active.
CR3 (Exhaust)	When lit, this yellow LED indicates that the Exhaust solenoid is active.
Jumpers	
JP1 (E/S Out)	**Output Signal Select** • Pins 1 and 2 jumpered—Makes the E-OUT signal available at J1, pin 5, allowing an external device to monitor the exhaust solenoid condition. • Pins 2 and 3 jumpered—Makes the S-OUT signal available at J1, pin 5, allowing an external device to monitor the Sensor (transducer) analog signal.
Potentiometers	
P1 (Span)	Provides adjustment of transducer signal gain, allowing an anticipated small transducer excursion to effect a full scale (0 to 12V) change at TP2.
P2 (Zero)	Provides adjustment for nulling the pressure transducer signal at zero pressure.
P4 (Gain)	Provides adjustment of feedback loop gain and affects the hysteresis (and frequency) for switching the intake and exhaust solenoids (not installed on later models).

Relay Board

PN 151xx404

y7Connectors	
J1	Connection to drive machine interface relay from either J6 of the Interface board or J1 of the glue inspection board
J2	Connection to supply beacon and alarm signals from the glue inspection board (151xx410).
J3	External connector used for interfacing the machine interface relay to the parent machine stop circuit.
J4	External connector used for interfacing a beacon/alarm for jam and glue-fault conditions.
Indicators	
D1 (RLY)	When lit, this yellow LED indicates that the machine interface relay is energized.
Replacement Fuses	
Beacon current limit	Label—F1 Type—PC Mount Value—3A Valco Number—085xx207

Glue Inspection Board

PN 151xx410

Connectors	
J1 (MSTOP)	Connection to drive machine interface relay on relay board
J2 (INDICTRS)	Connection to supply beacon and alarm signals to Relay board
J3 (KCK-VLV)	Connection to drive a spray marker, kicker, or diverter for rejected products
J4 (MARK-SCAN)	Not used
J5 (Scanner 1)	Connection for product scanner used to initiate glue inspection for Channel 1.
J6 (Scanner 2)	Connection for product scanner used to initiate glue inspection for Channel 2
J7 (Glue 1)	Connection for glue inspection sensor for channel 1
J8 (Glue 2)	Connection for glue inspection sensor for channel 2.
J9	Connection to LED board via a 10-pin ribbon cable
J10	Connection to CPU board via a 20-pin ribbon cable.
J11	Connection for 17VDC supply voltage from the power supply board

Indicators	
D1	This is a multi-segment LED indicator: **MSTOP**—When lit, this segment indicates that the machine stop signal relay is active. **HORN**—When lit, this segment indicates that the alarm/horn signal is active. **JAM**—When lit, this segment indicates that a jam condition exists. **G-GLT**—When lit, this segment indicates the previous product had a glue inspection fault. **KICK**—When lit, this segment indicates that the marker/kicker/diverter driver is active. **SCN1**—When lit, this segment indicates that the scanner for glue inspection channel 1 senses product. **SCN2**—When lit, this segment indicates that the scanner for glue inspection channel 2 senses product. **GLU1**—When lit, this segment indicates that the glue sensor for glue inspection channel 1 senses glue. **GLU2**—When lit, this segment indicates that the glue sensor for glue inspection channel 2 senses glue.
D2 (12 V)	When lit, this green LED indicates that the 12VDC supply voltage is available for I/O devices.
Replacement Fuses	
Marker/Kicker current limit	Label—F1 Type—PC Mount Value—0.75A Valco Number—085xx215
I/O current limit	Label—F2 Type—PC Mount Value—3A Valco Number—085xx207

Jumpers	
JP1	Horn activation: Pins 1 and 2 jumpered—glue fault and jam fault Pins 2 and 3 jumpered—glue fault only
JP2	Glue fault signal duration: JP2A—0.2 seconds JP2B—0.3 seconds JP2C—0.5 seconds None—1.0 seconds
JP4 (Irton Data)	Engineering use only
JP5 (Serial Comm)	Engineering use only—When jumper is installed, diagnostic data is available at JP4.
JP6	Future
JP7	Channel 1 rear-flap check: Pins 1 and 2 jumpered—enabled Pins 2 and 3 jumpered—disabled
JP8	Channel 2 rear-flap check: Pins 1 and 2 jumpered—enabled Pins 2 and 3 jumpered—disabled
JP9 (Test)	Engineering use only

Introduction

This section contains specifications for the VC3700 control.

Control Dimensions

Height:	19.55” (497mm)
Depth:	5.6” (142mm)
Width:	13.44” (341mm)
Input voltage:	115/230VAC, 2/1A, 50/60Hz (field-switchable)

Scanners

Inputs:	One per channel
Type/voltage:	NPN/sinking/12VDC
Configuration:	Independent for each channel or one linked to channels 1 and 2

Valve Outputs

Channels:	Two, one valve per channel
Peak voltage:	+56V, 1–10ms adjustable (maximum 600W instantaneous per channel, not to exceed 10% duty cycle)
Hold voltage:	+5V to +12V, adjustable

Encoder

Inputs:	One (40kHz maximum)
Type/voltage:	VCE-1000 recommended, 12VDC

Miscellaneous

Maximum gluing speed:	2000 feet (610m) per minute
Maximum glue length:	99.99” (2539mm)
Flow control:	Internal (EPC-6)
Maximum glue pressure:	100 psi (7 bar)
Job storage capacity:	99 jobs
Glue patterns:	One or two per channel
Scanner lockout function:	Internal
Jam preventer function:	Internal
Computer hardware interface:	RS-232 (optional) DB-9 socket, standard DTE
Machine interface relay:	One normally open and one normally closed contact, 24VDC, 24`VAC, 2A

Glue Inspection

Channels:	Two
Glue sensor type/voltage:	NPN, sinking, 12VDC
Product sensor type/voltage:	NPN, sinking, 12VDC
Spray marker driver:	Sinking, 12VDC, 1A
Pass/Fail tolerance bands:	± 0.2 inches, 0.4 inches, 0.8 inches

How to Order Parts

To order parts, please contact one of the following.

Valco Cincinnati, Inc. (USA)
Customer Service Department
411 Circle Freeway Drive
Cincinnati, Ohio 45246
TEL: (513) 874-6550
FAX: (513) 874-3612

Valco Cincinnati Limited
Hortonwood 32
Telford TF1 4EU
United Kingdom
TEL: (+44) 1952-677911
FAX: (+44) 1952-677945

You can also contact a Valco sales representative in your country. If you have any problems or questions regarding the piston pumps or any other Valco equipment, call Valco's Technical Service Department at the numbers listed above.

VC3700 Parts List

Description	Part #
PC9 adhesive system pedestal, 0-125 psi (1-9.6 bar) glue regulator and manifold	738xx173
PC9 adhesive system pedestal, 0-650 psi (1-45.8 bar) glue regulator and manifold	738xx174
Machine mount, 0-125 psi (1-9.6 bar) glue regulator and manifold	738xx177
Machine mount, 0-650 psi (1-45.8 bar) glue regulator and manifold	738xx178
Beam assembly, for use with 578xx032 trolley bracket	581xx298
Filter/regulator/manifold assembly, 0-125 psi (1-9.6 bar)	593xx245
Filter/regulator/manifold assembly, 0-650 psi (1-45.8 bar)	593xx246
PC board assembly, touch-screen	151xx324
PC board assembly, EPC-6 pressure control	151xx379
PC board assembly, CPU	151xx362
PC board assembly, 2-channel logic with jam preventer and scanner lockout	151xx363
PC board assembly, analog	151xx364
PC board assembly, LED	151xx406
PC board assembly, interface	151xx366
PC board assembly, 2-channel valve driver	151xx367
PC board assembly, power supply	151xx368
PC board assembly, RS232	151xx375
PC board assembly, relay and beacon interface	151xx404
PC board assembly, glue inspection logic	151xx410

Description	Part #
Fuse, 2A, 5 x 20mm, power entry module	085xx040
Fuse, 5A, 5 x 20mm, valve driver board, F1	085xx206
Fuse, 5A, PC mount, valve driver board, F2, F3	085xx216
Fuse, 3.15A, 5 x 20mm, power supply board, F1	085xx208
Fuse, 1.6A, 5 x 20mm, power supply board, F2	085xx209
Ribbon cable, 40-pin, LED/Interface	033xx087
Ribbon cable, 20-pin, valve driver/interface	033xx081
Ribbon cable, 26-pin, CPU/interface	033xx082
Ribbon cable, 20-pin, CPU/display	033xx083
Ribbon cable, 20-pin, glue inspect	033xx088
Transformer panel assembly (includes the following): Transformer, 24V Transformer, 36V Transformer, 28V	036xx119 550xx047 550xx032 550xx020
Power entry module, 115/230VAC	086xx055
Cord grip panel assembly	084xx002
Channel enable switch assembly	030xx429
Pressure adjust switch assembly	030xx430
Installation kit (includes the following): Fuse, 2a, 5 x 20 mm, power entry module (1) Fuse, 5A, 5 x 20 mm, valve driver board, F1 (2) Fuse, 5A, PC mount, valve driver board, F2, F3 (4) Fuse, 3.15A, 5 x 20 mm, power supply board, F1 (2) Fuse, 1.6A, 5 x 20 mm, power supply board, F2 (2) Fitting, male connector 1/4 x 1/8 (1) Fitting, male connector 3/8 x 1/8 (1) Fitting, male elbow 1/4 x 1/8 (1) Fitting, male elbow 3/8 x 1/8 (1) Hex key (1) Gauge, 0–160 psi Adapter, 1/4 NPT (female) Street "T", 1/8 NPT Cable assembly, line cord (Europe), no end plug (1) Line cord clamp (Europe) (1) Cable assembly, line cord (US), with end plug (1) Line cord clamp (US) (1) Fuse, 5A, PC mount, valve driver board, F2, F3 (4) (alternate fuses for 585 valves)	781xx136 085xx040 085xx206 085xx216 085xx208 085xx209 797xx323 797xx328 797xx338 797xx342 794xx453 786xx002 797xx029 797xx018 030xx422 066xx116 030xx493 066xx120 085xx216

Description	Part #
Snap track for CPU P.C. board	091xx382
Rivets, plastic (for mounting snap track)	091xx374
Extraction tool for chips	781xx174
I.C. Chip Assembly (U4, U5, U18, U19/20)	119xx052
Floppy disk for RS-232 interface (used by OEM for interfacing Valco equipment with OEM equipment)	119xx047

Optional Parts List

Description	Part #
Beacon with audible alert	481xx033
Beacon cable	030xx555

Recommended Spare Parts List—Mechanical

Description	Quantity	Part #
Valve seal kit (366-valve)	1	706xx178*
Repair kit, standard 585 non-contact valve	1	703xx304*
Repair kit, 2-inch extended 585 non-contact valve	1	703xx558*
Repair kit, 4-inch extended 585 non-contact valve	1	703xx305*
Soft-seal stem tip for TF612 and 712 non-contact valve	5	703xx797*
Spring, internal for TF612 and 712 non-contact valve	5	793xx271*
Repair kit for 832 fluid pressure regulator	1	593xx038
Repair kit for DD-1 pump	1	560xx560
12 VDC 3-way air solenoid	1	411xx057*
Encoder timing belt	1	788xx300*
Encoder measuring wheel	1	788xx553*
Filter screen, 50-mesh	1	593xx020*
Filter screen, 100-mesh	1	593xx087*
0-ring, glue filter cap	1	745xx059

* Check the type of part on your system before ordering

Recommended Spare Parts List—Electrical

Description	Quantity	Part #
LED scanner assembly	1	280xx105*
Fixed-field sensor	1	280xx093*
VCE-250 encoder	1	155xx027*
VCE-500 encoder	1	155xx029*
VCE-1000 encoder	1	155xx031*
PC board, touchscreen	1	151xx324**
PC board, CPU	1	151xx362**
PC board, channel 3 and channel 4 logic	1	151xx363**
PC board, analog	1	151xx364**
PC board, LED	1	151xx406**
PC board, interface	1	151xx366**
PC board, 2-channel valve driver	1	151xx367**
PC board, power supply	1	151xx368**
PC board, RS232	1	151xx375**
PC board assembly, EPC-6 pressure control	1	151xx379**
PC board assembly, glue inspection	1	151xx410**
PC board assembly, machine stop/beacon interface	1	151xx404
Fuse, 2A, power entry module	1	085xx040
Fuse, 5A, valve driver board, F1	1	085xx206
Fuse, 5A, valve driver board, F2, F3	1	085xx216
Fuse, 3.15A, power supply board F1	1	085xx208
Fuse, 1.6A, power supply board F2	1	085xx209
Glue inspection sensor, ultraviolet	1	280xx132**
Glue inspection sensor, capacitive	1	280xx152**
Cable glue sensor, ultraviolet or capacitive	1	0303xx596**

* Check the type of part on your system before ordering

** Customer's discretion on ordering as a spare part

Recommended Spare Parts List—DD-1 Pump

Description	Quantity	Part #
Rebuild and spare parts kit	1	560xx602

Warranty Information

Valco Cincinnati, Inc. warrants its equipment worldwide against defects in material and workmanship as outlined in this section.

Cold-Glue Equipment and Electronic Controls

One (1) year from the date of shipment by Valco Cincinnati.

Hot-Melt Units, Hoses, Valves, and Related Equipment

All components except cast-in heating elements are warranted for a period of six (6) months from the date of shipment by Valco Cincinnati. Cast-in heaters carry an additional, pro-rated warranty not to exceed three (3) years from the date of shipment by Valco Cincinnati.

Liability of the company is limited to repair of the product, or replacement of any part shown to be defective, and does not extend to defects caused by accidents, misuse, abuse, neglect, tampering or deterioration by corrosion. This warranty does not cover those items determined by Valco Cincinnati, Inc. to be normal wear items such as seals, O-rings, diaphragms, springs, etc.

Reconditioned equipment, unless specified otherwise at the time of purchase, will be warranted as described above for a period of ninety (90) days from the date of shipment by Valco Cincinnati.

Components purchased by Valco Cincinnati, Inc. from others for inclusion in its products are warranted only to the extent of the original manufacturer's warranty. In no event shall Valco Cincinnati, Inc. be liable for indirect or consequential damages arising out of the use of Valco Cincinnati products.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to Valco Cincinnati, Inc. for examination and verification. If claimed defect is verified, repairs or replacements will be made F.O.B. Cincinnati, Ohio, U.S.A. or ex-works Telford, U.K. If the inspection of the equipment does ***not*** disclose any defect of workmanship or material, any necessary repairs will be made at a reasonable charge and return transportation will be charged.

This is the only authorized Valco Cincinnati, Inc. warranty and is in lieu of all other expressed or implied warranties, representations or any other obligations on the part of Valco Cincinnati, Inc.

Service Needs

If you have problems with your system, please contact your Valco Cincinnati representative. If your need is urgent, we encourage you to contact our corporate office in Cincinnati, Ohio, U.S.A. at (513) 874-6550, or Valco Europe in the United Kingdom at (+44) 1952-677911. If the problem cannot be resolved on the telephone, Valco will promptly arrange to have a technical representative visit your facility. Any charges for a service call will be quoted at that time.Any part that fails during the warranty period shall be returned prepaid to Valco Cincinnati by the customer for disposition.

Note! Upon request, Valco Cincinnati personnel are available to repair or replace such parts at the customer's facility. Charges for this service include travel time and expenses.

If an equipment problem is the result of customer abuse, improper installation or operation, all travel time, labor, parts, and expenses will be charged to the customer.

If the responsibility for a problem cannot be absolutely determined, the customer will be charged for travel time and expenses only. No charge will be made for parts and labor.

Appendix A

Using the Repeat Function

The repeat function allows a glue pattern to be repeated up to 99x (99 times). This can be used to implement a stitch pattern to reduce quantity of glue consumption. A repeat value of 00x disables the repeat function for that channel. When the repeat function is enabled using a value from 01 to 99, the channel's second delay and pattern are repeated that number of times. A value of 01x will repeat the second delay and pattern one time (it will be performed two times).

Example:

To repeat a glue sequence of 0.5" delay (gap) and 0.5" pattern (glue) for 20 inches on channel 1, follow these steps:

1. At the level-2 menu, press the "GLUE MODE" button. The glue mode screen displays (Figure 27).

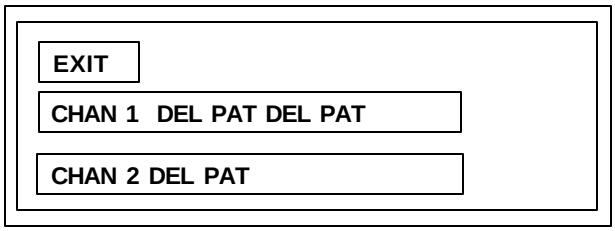


Figure 27. The Glue Mode Screen

2. Set the glue mode for channel 1 to DEL PAT DEL PAT (press the CHAN 1 button to toggle between the two selections).
3. Press "EXIT" to return to main screen.
4. At the main screen, touch one of the four-digit numbers on the top half of the screen. The glue-pattern edit screen displays (Figure 28).

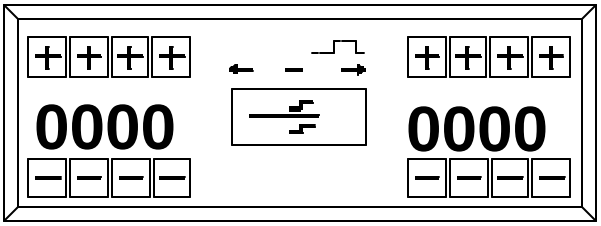


Figure 28. Glue-Pattern Edit Screen

5. Using the plus and minus keys, set the first delay (left parameter) to 00.50.
6. Using the plus and minus keys, set the first pattern (right parameter) to 00.50. (the first inch of the total 20 inches has now been programmed).
7. Press the symbol in the middle of the screen to return to the main screen.

8. At the main screen, touch one of the four-digit numbers on the bottom half of the screen. The glue-pattern edit screen displays (Figure 28).
9. Using the plus and minus keys, set the second delay (left parameter) to 00.50.
10. Using the plus and minus keys, set the second pattern (right parameter) to 00.50. (the second inch of the total 20 inches has now been programmed).
11. Press the symbol in the middle of the screen to return to the main screen.
12. Press the "CONFIG" button.
13. Press the "MORE" button in the level-1 menu screen. (The level-2 menu screen displays.)
14. Press the "REPEAT" button. (The repeat-function screen displays.)
15. Press channel 1. (The repeat setup screen for channel 1 displays.)
16. To program 18 additional inches of delay-pattern, press "1", and then press "8".
17. Press the "ENTER" button. The "OK DONE" message displays in the edit box and 18x displays in the repeat factor box (lower left corner).
18. Press the exit key to return to the level-2 menu.
19. Repeat steps 1-18 for channel 2.
20. Run the machine and check the pattern.
21. Adjust the first delay and pattern to move the last repeated glue pattern where desired.

Appendix B

RS232 Communications Interface

Do not install this upgrade with the power on.

The RS232 is an upgrade/option that allows information to be sent or received between the control and a remote host computer. The RS232 upgrade/option consists of the following:

- Printed circuit board
- Internal cabling
- 20-foot serial data communications cable with DB-9 female connections on each end
- DOS-compatible demo disk.

Note! The RS232 board is sensed by the control automatically and requires no special setup by the user.

Location Codes

Location codes are required to instruct the control where to store its data.

Note! The VC3700 will not respond to data shown in location codes pertaining to channels 3 and 4. It will also not respond to data shown in location codes 3,4 and 7,8 unless the respective glue modes are set.

1 Channel 1—Delay length
2 Channel 1—Pattern length
3 Channel 1—2nd Delay length
4 Channel 1—2nd Pattern length
5 Channel 2—Delay length
6 Channel 2—Pattern length
7 Channel 2—2nd Delay length
8 Channel 2—2nd Pattern length
9 Channel 3—Delay length
10 Channel 3—Pattern length
11 Channel 3—2nd Delay length
12 Channel 3—2nd Pattern length
13 Channel 4—Delay length
14 Channel 4—Pattern length
15 Channel 4—2nd Delay length
16 Channel 4—2nd Pattern length
17 Channel 1—Cell-to-gun distance
18 Channel 2—Cell-to-gun distance
19 Channel 3—Cell-to-gun distance
20 Channel 4—Cell-to-gun distance
21 Channel 1—Turn-on compensation
22 Channel 2—Turn-on compensation
23 Channel 3—Turn-on compensation
24 Channel 4—Turn-on compensation

25 Channel 1—Turn-off compensation
26 Channel 2—Turn-off compensation
27 Channel 3—Turn-off compensation
28 Channel 4—Turn-off compensation
29 Product scanned length
30 Ratio compensation
31 Glue mode channel 1:
0000 for Delay-pattern
0100 for Delay-pattern-Delay-pattern-mode
32 Glue mode channel 2:
0000 for Delay-pattern
0100 for Delay-pattern-Delay-pattern-mode
33 Measurement mode:
0000 for metric mode
0200 for inch mode
34 Scan mode:
0000—Normal mode. Independent scanners for channels 1 through 4.
0100—Scanner 1 triggers channels 1 and 2. Independent scanners for Channel 3 and 4.
0200—Independent scanners for Channels 1 and 2. Scanner 3 triggers Channels 3 and 4.
0300—Scanner 1 triggers channels 1and 2. Scanner 3 triggers channels 3 and 4.
35 Speed in feet per minute (receive only). Bytes 4-1 are hexadecimal digits.
36 Repeat factor for channel 1 (0 = no repeat)
37 Repeat factor for channel 2 (0 = no repeat)
38 Repeat factor for channel 3 (0 = no repeat)
39 Repeat factor for channel 4 (0 = no repeat)
40 Marker station distance from glue station
41 Marker skip distance from leading edge of product
42 Marker mark distance
43 Tolerance codes for glue inspection
1 = ±0.2 inches (5mm)
2 = ±0.4 inches (10mm)
3 = ± 0.8 inches (20mm)
100 Regenerate or redraw front screen (send only)
101 Reset the control (send only)

Data Format

Four bytes of data are always sent or received with preceding zeros completing the four bytes. The most significant byte (MSB, byte 4) is sent or received first. The least significant byte (LSB, byte 1) is sent or received last. Each data type is the ANSI code of the data being sent or received. ANSI codes for characters 0-9 are shown in Table 1.

Table 1. ANSI Codes for Characters 1-9

Character	ANSI Code
0	48
1	49
2	50
3	51
4	52
5	53
6	54
7	55
8	56
9	57

Note! The Visual Basic "Chr$" function returns a one-character string whose ANSI code is the argument.

Distance-type data in inch units assume two decimal places. Therefore, if 0,1,0,0 were sent, either 01.00 inches or 0100mm would be specified, depending on the inch/metric setting of the control. Time-type data (in milliseconds) assume one decimal place. Therefore, if 0,0,5,5 were sent, 005.5 ms would be specified. Data for ratio compensation (in pulses per inch) also use one decimal place.

Sending Information from Host to VC3700

Information may only be sent or received by the control if the main screen (the screen containing the pressure bar graph) is visible. Data can be sent or received while the control is gluing. However, the programmer must take care not to leave the data partly sent, since the control will appear to lockout the touch screen and minimum speed detection! This can leave the control open to undesirable effects. It is possible to regain control from this situation by sending groups of at least six zeros to the control from the host, but it is always better to send or receive the complete data format.

Transfer of information uses the following format at 9600 baud, no parity, 8 data bits and 1 stop bit:

1. Send send-request byte from host.

   Send-request byte = 254dec.

2. Receive ACK (acknowledge) byte from VC3500/3700.

   This indicates that the control will start looking for the data. After the request byte is received, the control returns ACK (255dec). If this byte is not returned after 500ms, the host must terminate the send.

3. Send byte 4, byte 3, byte 2, byte 1, location code from host.

   Byte 4=Msb and byte 1=Lsb.

Note! If the command is sent to redraw the front screen, the ACK signal can take up to 2 seconds to respond.

Example of Sending Data

Example:

Channel 1—Delay length = 100mm (1.00 inches)
Channel 1—Pattern length = 100mm (1.00 inches)

To send this information, follow these steps:

1. Send 254.
2. Wait for ACK.
3. Send 0,1,0,0,1.
4. Send 254.
5. Wait for ACK.
6. Send 0,1,0,0,2.

The front screen needs to be redrawn only after all the pattern data is sent, and only if the screen that the data is referenced to is visible. The control will respond to new data and update the glue line automatically upon reception of each new data packet, regardless of the information displayed by the screen.

It is better to send the redraw command after all of the data is transferred to the control, so that the data is sent at maximum speed. Timing problems may be encountered if attempts are made to redraw the screen after each send. If redrawing the screen after each send is required, a two-second delay (waiting for ACK) must be allowed for the redraw to take place.

To redraw the front screen, follow these steps:

1. Send 254.
2. Wait for ACK.
3. Send 0,0,0,0,100 (to redraw the front screen).

To set channel 1 turn-on compensation to 5.5ms, follow these steps:

1. Send 254.
2. Wait for ACK.
3. Send 0,0,5,5,21.

To set ratio compensation to 98.5 pulses, follow these steps:

1. Send 254.
2. Wait for ACK.
3. Send 0,9,8,5,30.

Receiving Information from VC3700

Receive information is required to update a secondary machine user interface, such as that found on a parent machine control.

The data is requested by the host computer, using the following format:

1. Send receive-request byte (from host).

   Receive-request byte = 253dec.
2. Receive ACK byte (from VC3700).
3. Send location code (from host).
4. Receive Byte 4, Byte 3, Byte 2, Byte 1 (from VC3700).

Example of Receiving Data

To display the first glue pattern length, follow these steps:

1. Send 253.
2. Wait for ACK.
3. Send 2.
4. Receive b4,b3,b2,b1.

Note! The measurement mode of the VC3700 control needs to be determined by the host in order for the host to display the information in inch or metric mode.

Note! When switching between the inch and metric modes via the RS232 link, the data is not converted accurately.

Appendix C

Introduction

The following configuration may be required for customer applications.

Four Patterns from a Single Glue Valve

In order to apply up to four glue patterns from a single glue valve, follow these steps:

Electrical Connections:

1. The “scanner-1” connector (J1 of the interface board) must be used as the interface point for the single scanner used in this configuration. Connect the scanner cable to J1 on the interface board as follows:

   Pin 1: +12VDC
   Pin 2: Scanner signal
   Pin 3: Return

2. Install a wire jumper from J3, pin 3 to J4, pin 3 on the valve driver board in order to parallel the outputs of Channels 1 and 2.

3. Connect the glue valve cable to J3 on the valve driver board as follows:

   Pin 1: Purge input
   Pin 2: Purge return
   Pin 3: Valve output
   Pin 4: Valve return

Menu Setup and Pattern Entry:

4. In the level-2 menu screen, press the “GLUE MODE” button.

5. Select DEL PAT DEL PAT for both channels 1 and 2. (The “CHAN 1” and “CHAN 2” buttons toggle back and forth between DEL PAT and DEL PAT DEL PAT.)

6. In the level-2 menu screen, press the “SCAN MODE” button.

7. Press the “SCAN 1 1-2” button.

8. In the glue-pattern-edit screens for Channel 1, enter delay and pattern information for the first two patterns.

9. In the glue-pattern-edit screens for Channel 2, enter delay and pattern information for patterns three and four.

Appendix D

Introduction

This section contains specific information about the VC3700J control, which is a single-channel control.

Overview

Since the VC3700J is a single-channel control, the main screen displays the delay dimension in the upper left corner of the screen and the pattern dimension in the upper right corner of the screen. The lower portion of the screen displays a figure that enables the learn mode when pressed. Once the learn mode is enabled, the control measures the product length, subtracts the delay dimension on both the leading and trailing edges, and enters the remaining length into the pattern dimension. The control then glues any products that pass under the product scanner.

Installation of Product Scanner

In order to achieve optimum measurement capability, care must be taken in locating the product scanner and adjusting its sensitivity. To install the product scanner, follow these steps:

1. Locate the product scanner 1-2 inches above the product.
2. Apply power to the glue control.
3. Place product 0.75 to 1.00 inches below normal product travel.
4. Turn the adjustment screw counterclockwise until the LED is not illuminated.
5. Adjust the product scanner sensitivity by turning the adjustment screw clockwise just until the LED illuminates.

Electrical Installation of Remote Learn Button

The cable used to connect the remote learn button to the VC3700J control should have a minimum of two conductors (18-22 AWG) and a shield.

To connect the remote learn button to the control, follow these steps:

1. Insert the remote learn button cable into the control enclosure through a cord grip located on the bottom panel of the control.
2. Connect the remote learn button cable to the three-terminal connector labeled “scanner 2”.

   Connections are as follows:

   Pin 1: No connection

   Pin 2: Signal

   Pin 3: Return
3. Connect shield wire to the protective earth (P.E.) terminals located near cord-grip base plate.
4. Tighten the cord grip used by the remote learn button cable.

Operation

To use the learn mode, follow these steps:

1. Type a delay dimension in the upper left corner of the main screen and press the ENTER key. This is the length of product not glued at both the leading and trailing edges.
2. Press the lower part of the main screen to enable the learn mode.
3. Allow one product to pass under the product scanner. (The control measures the product length, subtracts the delay dimension on both the leading and the trailing edges, and enters the remaining length into the pattern dimension.) Normal gluing will begin with the next product.

Note! Either the delay or pattern dimensions may be altered to affect changes in the glue pattern placement.

Menu Buttons

Since the VC3700 is a single-channel control, the following menu buttons are omitted:

Level-2 menu screen—SCAN MODE< GLUE MODE

Level-3 menu screen—CELL-GUN 2, CELL-GUN 3, CELL-GUN 4

Level-4 menu screen—COMP CHAN 2, COMP CHAN 3, COMP CHAN 4

Appendix E—Maintenance Procedures

Introduction

This appendix contains recommended daily, weekly, 3-month, 6-month, and 12-month maintenance procedures for the VC3700 system.

The maintenance procedures contained in this appendix are to be used for cold-glue systems only. OTHERWISE, DAMAGE TO EQUIPMENT COULD OCCUR.

Daily Maintenance

Action	Date	Shift	Initials
1. Clean the exterior portion of the glue valves, nozzle tips, glue heads, etc. 2. Purge the glue valves if necessary, and ensure proper glue flow. 3. Ensure that air and glue pressure settings are correct. 4. If using glue inspection: Ensure that sensor is clean. (Lens must be clean and clear with no scratches.) Check sensor for proper height adjustment. Adjust for proper sensitivity if necessary.			

Weekly Maintenance

Actions	Date	Shift	Initials
1. Clean the glue filter thoroughly with water.			
2. *For electric-coil non-contact valves only*—disassemble the fluid section of the glue valve, and clean the section thoroughly with water.			
3. If you are using a 585 valve, replace the valve spring.			
4. *For non-contact valves only*—lubricate the valve with Teflon oil (supplied with maintenance kit).			
5. Reassemble the fluid section.			
6. Using the 3-way purge valve on the output of the glue filter, purge all air from the system.			
7. Purge each valve in the system. (Approximately 1-2 ounces of glue should be purged for proper glue flow.)			
8. Check for any glue leakage on the needle seat. Replace the needle/plunger assembly and seat if leaks or dripping occurs.			
9. *For non-contact valves only*—Apply a small amount of lithium grease to the nozzle seat area before attaching the retaining nut.			
10. Check all quick-disconnect fittings for any dried glue or swelling that may restrict the glue flow.			
11. Lubricate each quick-disconnect fitting with lithium grease or equivalent.			

3-Month Maintenance

Actions	Date	Shift	Initials
1. Encoder mounting: a. Check timing belt, gear and pulley teeth, and proper timing belt tension.. b. If using measuring wheel, check for wear and proper wheel tension on machine belt. c. If using direct-drive encoder, check coupling and rotation of shaft for proper alignment. 2. Perform the "Weekly Maintenance" procedure.			

6-Month Maintenance

Actions	Date	Shift	Initials
1. Flush entire glue system, *except for the central pumping system*, with a vinegar and water solution (1 gallon of vinegar to 10 gallons of water). 2. Perform the "Weekly Maintenance" procedure.			

12-Month Maintenance

Actions	Date	Shift	Initials
1. Flush the entire glue system, *including the central pumping system*, with a vinegar and water solution (1 gallon of vinegar to 10 gallons of water). 2. Disassemble, thoroughly clean, and rebuild each fluid-regulator assembly and glue valve. 3. Perform the "Weekly Maintenance" procedure.			

VC3500/VC3700
Troubleshooting Manual

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System Level Documents

Abbreviations/Definitions

CPU	Central Processor Unit board
EPC	Electro-Pneumatic Control module
LCD	Liquid Crystal Display and Touchscreen module
LED	Light Emitting Diode board
PEM	Power Entry Module
RS232	RS232 communications board
XF1	Transformer 1, 24 VAC, 175 VA
XF2	Transformer 2, 36 VAC, 80 VA
XF3	Transformer 3, 28 VAC, 80 VA

Reference Document List

System level

999xC084-04	Functional Block Diagram, VC3500
999xC084-05	Functional Block Diagram, VC3700
999xB084-01	Customer Connections
084xx003	
Page 1	Wiring Diagram
Page 2	Exterior Assembly
Page 3	Interior Assembly
084xx005	Jam Relay Cabinet assembly and wiring, Obsolete
084xx020	Jam Relay Cabinet assembly and wiring

Board level

Assembly Drawings

151xx362	CPU board
151xx363	Channel 3 & 4 Logic board
151xx364	Analog board
151xx365	LED board, VC3500 only
151xx366	Interface board
151xx367	Valve Driver board
151xx368	Power Supply board
151xx375	RS232 communications board
151xx379	EPC board
151xx404	Machine Interface Relay board
151xx406	LED board, VC3700 only
151xx407	Grounding Board
151xx410	Glue Inspection board

Schematics

999xD151-198	CPU board
999xB151-199	Channel 3 & 4 Logic board
999xC151-200	Analog board
999xD151-201	LED board, VC3700 only
999xD151-202	Interface board
999xD151-203	Valve Driver board
999xB151-204	Power Supply board
999xB151-208	RS232 communications board
999xC151-209	EPC board
999xD151-218	LED board, VC3700 only
999xD151-219	Glue Inspection board
999xA151-220	Machine Interface Relay board

Test Procedures

ETS010	Transformer Panel (036xx119)
ETS011	CPU Board (151xx362)
ETS012	Analog board (151xx364)
ETS013	LED board (151xx365)
ETS014	Power Supply board (151xx368)
ETS015	Interface board (151xx366)
ETS016	Valve Driver board (151xx367)
ETS017	Base Unit (084xx003) (Not a complete control)
ETS021	EPC board (151xx379)
ETS030	RS232 board (151xx375)
ETS032	VC3500J (with Learn Mode)

System Level Description

Input Power

PEM (Power Entry Module)

The PEM is a VDE/IEC approved module that performs several functions; voltage selection, on-off control, over-current protection, and EMI filtering. The PEM accepts an IEC320 approved line cord to provide the VC3500 either 230 VAC or 115 VAC.

Voltage selection is accomplished by removing the fuse drawer and replacing it so that the correct voltage is displayed in the fuse door window. The fuse drawer places the primary windings of transformers XF1, XF2, and XF3 in series when in the 230vac setting, and in parallel when in the 115vac setting. The double pole fuse drawer accepts either 5x20 mm IEC fuses, or 1/4 x 1 1/4 inch UL fuses. For line-to-neutral operation, use the shorting clip (jumper) and one fuse. The shorting clip must be on the left side of the fuse drawer (when rotated to read the correct voltage). For line-to-line operation, use two fuses.

For operation from a single phase power main, a single fuse should be installed on the 'hot' side of the line only and a shorting jumper should be installed on the 'neutral' side. For operation from a three-phase power main, dual fuses should be installed.

The PEM provides on-off control through a double pole switch.

Finally, a filter is utilized to prevent line noise from interfering with the operation of the VC3500, and to prevent high frequency signals generated within the VC3500 from appearing on the power lines.

XF1 (Transformer 1) A41-175-24

The primary winding of Transformer 1 is connected to the PEM and so will have either 230 VAC or 115 VAC applied to its primary terminals. The secondary voltage of 12 VAC (dual secondary windings in parallel) is delivered to J2 of the Valve Driver Boards where it is converted to a variable 5 to 12 vdc for the **Valve Hold Voltage**.

XF2 (Transformer 2) A41-80-36

The primary winding of Transformer 2 is connected to the PEM and so will have either 230 VAC or 115 VAC applied to its primary terminals. The secondary voltage of 36 VAC (dual secondary windings in series) is delivered to J2 of the Valve Driver Boards where it is converted to 56 vdc for the **Valve Peak Voltage**.

XF3 (Transformer 3) A41-80-28

The primary winding of Transformer 3 is connected to the PEM and so will have either 230 VAC or 115 VAC applied to its primary terminals. The secondary voltage of 14 VAC (dual independent windings) is delivered to J1 of the Power Supply board where it is converted to several DC voltages for use throughout the system.

Power Supply board

The Power Supply board's input connector J1 receives 24vac from the secondary winding of Transformer 3 (two 12vac windings in series). J2 provides access for a regulated 12 vdc, 1A, current protected, source for the backlight of the LCD/Touchscreen module. J3 provides access for an unregulated 17 vdc source for illumination of LED light bars on the LED board. J4 provides access for an unregulated 17 vdc source for the CPU board. J5 provides access for an unregulated 17 vdc source for the Interface board. J7 provides access for an unregulated 32 vdc source for a DD-1 pump.

Main Control

CPU (Central Processor Unit) board

The CPU board provides all logic control functions of the VC3500 including the following:

- A **main processor** oversees communications with the LCD/Touchscreen Module, Channel Logic processors, Scanner Lockout Processors, and RS232 communications board.
- **Battery backed memory** is available to hold parameters for 99 glue programs.
- **Reset/Watchdog circuitry** ensures the main processor does not get caught in a non-recoverable program loop.
- **Channel Logic processors** for channels 1 & 2.
- **Scanner Lockout processor** for channels 1 & 2.

Channel Logic 3 & 4 board

The Channel Logic board for channels 3 & 4 is an optional daughter board that attaches directly to the CPU board using connectors J5 and J6. It includes the following:

- **Channel Logic processors** for channels 3 & 4.
- **Scanner Lockout processor** for channels 3 & 4.

RS232 communications board

The RS232 communications board is an optional daughter board that attaches directly to the CPU board using connectors J1 and J2. It provides capability of interfacing the VC3500 to another RS232 compatible device for program download and storage. A flat ribbon cable connects the internal RS232 port to a DB-9 male connector on the bottom surface of the VC3500 for easy access.

Glue Inspection Logic board (VC3700 only)

The Glue Inspection Logic board gets pattern information from the CPU board and sensor information directly at its terminals. It then controls pass/fail indicator lights on the front panel, Machine Interface Relay, spray marker/kicker/diverter, and lights and horn on beacon

Glue Pressure Control

Analog board

The Analog board determines (along with the EPC-6) the necessary air pressure to be applied to the glue source from 1.) the line speed determined from the frequency of encoder pulses, and 2.) the "Glue Pressure" pushbutton/toggle on the front panel. The pressure value requested, stored in a digital potentiometer, is sent to the EPC module to control the air pressure. The pressure transducer signal from the EPC-6 is fed back to this board, buffered, then sent to the CPU board to inform the main processor.

EPC (Electro-Pneumatic Control) module

The EPC controls air pressure to the glue source as a function of line speed. Three air ports exist on a single manifold mounted to the EPC. From top to bottom, they are:

- Shop air input
- Speed dependent air output
- Exhaust air

User Interface

LCD/Touchscreen module

The LCD/Touchscreen displays glue program and system level parameters. It also provides the means for user input via a multi-level menu. A “backdoor” PIN code of ‘362436’ can be used to gain access to menus beyond Menu 2. This code is in addition to a customer defined 4-digit PIN, and should not be revealed to customers.

LED board

The LED board displays on/off status of glue valves, scanners, encoder, and system power supplies. It also displays whether the line is below or above minimum speed and the jam condition. Glue valves can be individually "Enabled" for gluing programs, disabled ("0"), or turned on for purging ("1") using front panel pushbutton/toggle switches. Signals from these switches are routed through the Interface board to the CPU board.

On a VC3700, indicators display the status of the Glue Inspection process.

Input/Output

Interface board

The Interface board provides a connection point and signal conditioning for the following signals:

- Scanner signal inputs are optically isolated and can be connected to J1, J2, J3, and J4. A scanner with an operating voltage of 12 VDC must be used.
- The Encoder signal input is optically isolated and is connected to J5. An encoder with an operating voltage of 12 VDC must be used.
- A Jam signal, available at J6, is an active-low, open-collector signal that can be used to drive a relay with a coil voltage of 12 VDC, 150mA maximum.
- A Dump Valve Control signal, available at J7, is an active-low, open collector signal that can be used to control a dump valve circuit of 12 VDC, 750mA maximum.

Valve Driver board

The Valve Driver board receives pattern information from the CPU board and through the Interface board at connector J1 for its two channels. Connector J2 is the input for voltages of 30 VAC and 24 VAC for driving valves. A spike voltage of 56 VDC is generated on board and has an adjustable time duration via a potentiometer. An adjustable hold voltage (5 to 12 VDC) is also generated on board. Connectors J3 and J4 are the connection points for two valves.

Machine Interface Relay board

The Machine Interface Relay board includes the relay to interface to a machine's stop circuit for either a Jam condition or a Glue Inspection fault. Connector J3 is accessible through the base plate, and it's mating field-wirable connector is used to make the wiring connection to the machine's stop circuit.

Ground References

Protective Earth (Lined ground symbol with circle)

To satisfy the European Community's safety directive, all electrical and electronic mounting surfaces are bonded to a single point referred to as 'protective earth' and denoted by a lined ground symbol within a circle. This point is located towards the bottom of the main panel. On later models, a terminal board (151xx407) is provided to allow multiple connections to this point.

Input Ground (Lined ground symbol)

In order to provide noise isolation for the logic circuits, a separate power supply circuit is provided for scanners, encoder, jam signal and dump-valve signal. Bridge rectifier BR2 (on the Power Supply board) rectifies 14VAC to an unregulated 17VDC. This 17 VDC leaves the Power Supply board via connector J5 and enters the Interface board via J7. A 12V regulator (U1) on the Interface board supplies a regulated 12 V supply voltage for scanners and encoder.

Valve Output Ground (Filled triangle ground symbol)

The power source to drive glue valves comes from transformers XF1 (Peak voltage) and XF2 (Hold voltage). In order to provide noise isolation for the logic circuits, these supplies are isolated from other references via -isolators on the Interface board.

Logic Ground (Open triangle ground symbol)

Logic ground is isolated from chassis (earth) ground and is used as a reference for all other circuits that do not leave the control.

CPU (Central Processing Unit) board - 151xx362

(Reference Schematic 999xD151-198)

Service Access Points

Connectors

J1, J2	Connection for the optional RS232 daughter board.
J3	Connection to LCD/Touchscreen module via a 20 pin ribbon cable.
J4	Connection to Glue Inspection board (VC3700 only).
J5, J6	Connection for the optional Channel 3 & 4 Logic daughter board.
J7 (not used)	In early models, connection to LED board to deliver analog pressure feedback signal to CPU.
J8	Connection to Interface board via a 26 pin ribbon cable.
J9	Connection for 17 VDC supply voltage from the Power Supply board.

Indicators

D1 (Reset)	When lit, this red LED indicates that the main processor (68000) is being given a hardware reset.

Jumpers

2/4 Channel Select	A wire jumper near the center of the board determines whether two-channel or four-channel software is utilized. Installed: A jumper installed dictates that two-channel software is used. Not Installed : No jumper dictates that four-channel software is used.

Switches

A pushbutton near the upper left corner provides a manual reset function.

Test Points

TP1 (CLOCK)	8 MHz, 5 V digital clock signal from Oscillator U7 for Main Processor U1.
TP2 (CNTR-CLK)	5 V Encoder signal gated by a timer from U17 (68230, PB6). These gated encoder pulses are counted by U9 (74HCT293). Periodically, the 68000 main processor queries this binary count through port lines PA0 through PA7 of U17. The 68000 main processor then calculates line speed from knowing the number of encoder pulses in a given time period.
TP3 (MIN SPEED)	This signal will be low when the line speed is Greater than minimum speed. This signal will be high when the line speed is Lower than minimum speed.
TP4 (PRESSURE)	This analog signal (0 to 5 vdc) represents the air pressure sensed by the EPC-6.
TP5 (+5V)	Small pad located near lower right corner of board.
TP6 (GND)	A U-shaped pad on the right edge provides the reference for all logic signals.

Schematic Description

Main Processor

A 68000 (U1) performs the following functions:

- Control of LCD/Touchscreen module.
- Storage of glue programs.
- Communications with Channel Logic processors.

Reset/Watchdog Circuit

A DS1232 (U6) provides both reset and watchdog functions. "/DTACK" must occur every 150mS (typical) or a reset will occur. The reset signal is buffered by open-collector drivers (U8) because the "/HALT" and "/RESET" signals can be both read and driven by the 68000.

Clock Circuits

An 8 MHz oscillator (U7) provides timing for the 68000. The 87C51's (U18, 19, 20) each have a 12 MHz crystal.

Address Decode Circuit and /DTACK

74HCT138's (U10,12) provide all address decoding. These decoding signals are OR'ed together to derive the "/DTACK" signal required by the 68000. A "/DTACK" signal returned to the 68000 indicates that a peripheral device has read or written data to the bus, and therefore the 68000 can continue with the next program step.

Operating System Memory

27C512 PROM's (U4,5) are used to store the operating system. Two-channel software resides in the lower half, and four-channel software resides in the upper half. A jumper near the center of the board should be installed (or switch set to 'ON') so the lower half of memory is enabled (two-channel). This jumper should be cut (or switch set to 'OFF') to enable the upper half of memory (four-channel).

Battery-Backed Program Memory

BQ4011 RAM's (U2,3) store program parameters

Touchscreen Interface

74HCT245 bi-directional buffers (U15,16) pass the data and control signals to the LCD/Touchscreen. U15 is fixed to only send address and control signals. U16 is controlled by "R/W" to determine the direction of data flow.

Encoder Count Circuit (Speed Calculation)

A timer within U17 (68230) outputs an active-low signal for 100mS from its port at PB6 to U8.3. This open-collector output (U8.4), when high, allows encoder pulses to pass to the clock input of a 74HCT393 counter (U9.1). Periodically, the 68000 will read this counter's 8-bit output through port PA of U17 (68230) and calculate the line speed. The 68000 uses this information to size the length of the bar graph in the Minimum Speed screen to indicate line speed.

Auxiliary Port Signals (U14-68230)

Port PC of U14 is used as the data link between the 68000 and the Channel Logic processors (U19,20). Port PB of U14 is used to control the flow of data between these devices.

Scanner Lockout Function

U18 (87C51) provides the Scanner Lockout function and Jam Indication for Channels 1 & 2.

Channel Logic Function

U20 (87C51) provides the Channel Logic function for Channel 1. U19 (87C51) provides the Channel Logic function for Channel 2.

Analog Pressure Circuit

A buffered representation of the sensed air pressure ("ANALOG BAR GRAPH" from U4.7 of the Analog board) is presented to the positive input of an A/D converter (U21 - LTC1096). The serial output of this device is read by the 68000 through port PB0 of U17. The 68000 uses this information to size the length of the pressure bar graph on the LCD/Touchscreen.

Channel 3 & 4 Logic board - 151xx363

(Reference Schematic 999xB151-199)

Service Access Points

Connectors

J5, J6	Connection to the CPU board.

Schematic Description

Scanner Lockout Function

U1 (87C51) provides the Scanner Lockout function and Jam Indication for Channels 3 & 4.

Channel Logic Function

U2 (87C51) provides the Channel Logic function for Channel 3. U3 (87C51) provides the Channel Logic function for Channel 4.

Analog board - 151xx364

(Reference Schematic 999xD151-200)

Service Access Points

Connectors

J1, J2	Connection to the LED board.

Jumpers

JP1	**Low Pressure Limit Select** A low air pressure limit may be selected for delivery to glue source. Normally, this is set to 0%. Other possible selections are 10, 25, and 50% of full pressure.

Potentiometers

P1 (Bar 0-Adj)	Allows adjustment of the pressure bar graph on the LCD/Touchscreen to a minimal length for zero speed.
P2 (Gain Adj)	Not used. In early models, allowed adjustment to gain of frequency-to-voltage converter U3. Increasing the gain will increase the analog voltage at J2, pin 3 (to the EPC) for a given frequency of encoder pulses.

Schematic Description

12v Analog Supply

The 12v supply for analog circuits is derived from the LED board at connector J2, pin 10. Choke L1 provides current stability.

5v Logic Supply

The 5v supply for logic circuits is derived from the LED board at connector J2, pin 9.

Glue Pressure Pushbutton/toggle Interface

A demand for increase in glue pressure enters the board at connector J2, pin 2. This active-high signal is presented to the digital pot U1, pin 2 to place it in an "UP" mode. At the same time, the active-low signal at U1, pin 7 enables the chip to count pulses at pin 1 from a free-running oscillator circuit. The resistor in the digital pot provides the negative feedback from op-amp U4, pin 14.

Speed Tracking Circuit

Encoder pulses from connector J1, pin 10 are input to Frequency-to-voltage converter U3 at pin 6. Op-amp output U4, pin 14 allows this voltage (and the glue pressure) to be varied by adjusting Digital Pot U1. Op-amp output U4, pin 1 acts as an adder to add an offset (determined from setting of Jumper JP1) to be added to the previous op-amp stage. This provides a low limit to the drive signal for the EPC-6, therefore a low limit to air pressure that supplied to the glue source.

Pressure Bar Graph Driver

The buffered analog signal from the pressure transducer on the EPC-6 is present at connector J2, pin 4. Op-amp output U4, pin 7 provides zero-adjust of the LCD/Touchscreen pressure bar graph through potentiometer P1. This analog output signal is sent to the CPU board, converted to a digital signal, then is used by the 68000 main processor to display the glue pressure bar graph.

LED board - 151xx365 (VC3500) or 151xx406 (VC3700)

(Reference Schematic 999xD151-201 or 999sD151-218)

Service Access Points

Connectors

CO1	VC3500: Connection to Interface board via a 30 pin ribbon cable. VC3500: Connection to Interface board and Glue Inspection Board via a 40 pin ribbon cable. This cable is split with the first 10 conductors going to the Glue Inspection Board.
J2	Connection for 17 VDC supply voltage from the Power Supply board.
J3, J4	Connection to Analog daughter board.
J5	Connection to EPC via a four conductor cable.
J6, J7	Connection for front panel Channels 1 & 2 Enable switches.
J8, J9	Connection for front panel Channels 3 & 4 Enable switches. VC3700 only.
J10	Connection for front panel Pressure Adjust switch.

Schematic Description

5v Logic Supply

A 7805 (U6) provides a regulated 5v supply for logic on this board. Resistor R2 is in series with the regulator to provide some voltage drop to decrease the power dissipation across the regulator.

12v EPC-6 Supply

A 7812 (U7) provides the supply voltage for the EPC-6.

Valve Enable Switch Inputs

Valve enable and purge signals for four channels are conditioned by schmitt trigger gates from U2 and U3 before being sent to the Interface board.

LED Drivers

In general, ULN2803's are used to drive the LED light bars for the front panel indicators. These are merely DIP-packaged npn transistors.

The signal for the Encoder LED light bar is first sent to the monostable multivibrator U8 (74HC221) to provide a blink for every encoder level change (or transition).

Encoder Buffer

The encoder signal from connector CO1, pin 4 is buffered and level-shifted from 5v to 12v by npn transistor Q1 before it is sent to the Analog board.

Interface board - 151xx366

(Reference Schematic 999xD151-202)

Service Access Points

Connectors

CO1	Connection to LED board via a 30 pin ribbon cable.
CO2	Connection to CPU board via a 26 pin ribbon cable.
CO3	Connection to Valve Driver board(s) via a 20 pin ribbon cable.
J1, J2, J3, J4	Connection for product scanners.
J5	Connection for encoder.
J6	Connection for Machine Interface Board for machine stop relay.
J7	Connection for 17 VDC supply voltage from the Power Supply board.
J8	Connection for dump-valve (glue by-pass valve).

Replacement Fuses

Function	Label	Type	Value	Valco Number
12vdc I/O Supply	F1	PC Mount	1.5A	085xx132
Dump Valve Active	F2	PC Mount	1.5A	085xx132

Indicators

D1 (12V)	When lit, this green LED indicates that the 12vdc supply for scanners, encoder, and by-pass valve (dump valve) is operational.
D2	When lit, this yellow LED indicates that the by-pass valve is activated and that the parent machine is above minimum speed.

Jumpers

JP1 & JP2	**Valve Driver Type**	
	Pins 1 & 2 jumpered:	Use of 151xx367 Valve Driver Board.
	Pins 2 & 3 jumpered:	Future use.
JP3	**Future**	
	Pins 2 & 3 jumpered:	Normal.
JP4	**Future**	
	Pins 2 & 3 jumpered:	Normal.

Schematic Description

Ground Reference

The ground reference used on this board for encoder and scanner inputs is isolated from other grounds used in the system. Opto-isolators on the Interface board provide this isolation.

PAL Logic

A 20V8 PAL (U9) provides all logic between input and output signals. PAL equations and the equivalent gate logic circuit is included on Schematic 999xD151-202.

Scanner and Encoder Inputs

A 12 VDC on-board regulator provides an isolated power source for scanners, encoder, Jam signal, and Dump Valve Control signal. Scanner 1 through Scanner 4 and Encoder signals should have open-collector, active low outputs. These signals each have a small filter circuit (3-terminal capacitors), then are optically-coupled to logic circuits referenced to digital ground (symbol denoted by an open triangle). These logic signals are then transferred to 1) the LED board to drive status indicators, and 2) the CPU board for signal processing.

The 3-terminal capacitors are provided to pass fast transients to ground without damaging other components. Input protection diodes to ground ensure that a large negative spike will not cause damaging currents to flow through the opto-isolators. The encoder input circuit requires a fast response of 40 kHz, so a 6N137 device was used.

> At the maximum rate of 2000 feet per minute, using a 1000 pulse encoder, and a 10 inch wheel;
>
> (2000 ft/min) * (100 pulses/inch) * (1 min/ 60 sec) * (12 in/ft) = 40 kHz

All other opto-isolators use the slower 2630's.

Jam Output

The Jam Output signal at J6 uses an open-collector circuit to energize the coil of a 12 vdc relay when a jam condition occurs. This signal is turned off (goes to 12 vdc) when the parent machine speed drops below minimum speed. This circuit can drive a maximum load of 500mA. This output signal is normally connected to J1 of the Machine Interface Relay board (151xx404) to drive relay RL1. This relay provides an immediate machine stop.

A delayed stop for special machine control is available when Jam Relay Cabinet (084xx020) is used. Both a standard relay (for immediate stop) and a timer relay (160xx183) is installed.

Dump-Valve Control Output

The Dump-Valve Control Output signal at J8 uses an open-collector circuit to normally energize the coil of a 12 vdc relay. When machine speed falls below minimum speed, this signal is turned off (goes to 12 vdc) to turn off the dump valve. This circuit can drive a maximum load of 750mA.

Valve Driver Signals

The signal to fire a valve can be sent to the Valve Driver board when one of the following conditions occur (controlled by gates U9,10):

1. The "/PURGE" signal on connector CO1 (derived from the front panel Channel Enable switch) must be low, or
2. The "/VAL-CH" signal on connector CO1 (derived from the front panel Channel Enable switch) must be low AND the "/CHAN-OUT" signal on connector CO2 (from the Channel Logic IC on the CPU board) must be low.

The outputs of valve drive signals as well as Peak and Hold voltage status signals from the Valve Driver board are also isolated to provide noise immunity for logic and analog circuits. The ground reference used for valve driver signals is denoted by a filled-in triangle.

Valve Driver board - 151xx367

(Reference Schematic 999xD151-203)

Service Access Points

Connectors

J1	Connection to Interface board via a 10 pin ribbon cable.
J2	Connection for transformer secondary voltages to form the 56 vdc peak voltage and the 12 vdc hold voltage.
J3	Connection for the first glue valve on this card.
J4	Connection for the second glue valve on this card.

Indicators

D1 (IN1)	When lit, this yellow LED indicates that an input signal has been received from the Interface board to energize glue valve 1.
D2 (IN2)	When lit, this yellow LED indicates that an input signal has been received from the Interface board to energize glue valve 2.
D3 (12V)	When lit, this green LED indicates that the 12 vdc hold voltage is available to energize a glue valve.
D4 (15V)	When lit, this green LED indicates that 15 vdc input to regulator U3 is present.
D5 (56V)	When lit, this green LED indicates that the 56 vdc peak voltage is available to energize a glue valve.
D6 (HOLD-1)	When lit, this yellow LED indicates that the 12 vdc hold voltage is applied to glue valve 1.
D7 (PEAK-1)	When lit, this yellow LED indicates that the 56 vdc peak voltage is applied to glue valve 1.
D8 (HOLD-2)	When lit, this yellow LED indicates that the 12 vdc hold voltage is applied to glue valve 2.
D9 (PEAK-2)	When lit, this yellow LED indicates that the 56 vdc peak voltage is applied to glue valve 2.
D10 (Fault F2)	When lit, this red LED indicates a fault with Fuse F2.
D11 (Fault F3)	When lit, this red LED indicates a fault with Fuse F3.

Replacement Fuses

Function	Label	Type	Value	Valco Number
Hold Voltage current limit	F1	5 x 20 mm	5A	085xx206
Channel 1 current limit	F2	PC Mount	5A	085xx216
Channel 2 current limit	F3	PC Mount	35A	085xx216

Jumpers

JP1	**Common/Independent Output Control** Pins 1 & 2 jumpered: For the first Valve Driver board (Channels 1 & 2), this causes both outputs to be controlled from Channel 1 program parameters. For the second Valve Driver board (Channels 3 & 4, VC3500 only), this causes both outputs to be controlled from Channel 3 program parameters. Pins 2 & 3 jumpered: Allows outputs to be controlled independently.
JP2	**Fixed/Variable Peak Voltage duration for Channel 1** Pins 1 & 2 jumpered: Forces a fixed Peak Voltage duration of 3.5mS for Channel 1. Pins 2 & 3 jumpered: Allow adjustment of Peak Voltage duration of 1mS to 10mS for Channel 1 using potentiometer P1.
JP3	**Fixed/Variable Peak Voltage duration for Channel 2** Pins 1 & 2 jumpered: Forces a fixed Peak Voltage duration of 3.5mS for Channel 2. Pins 2 & 3 jumpered: Allow adjustment of Peak Voltage duration of 1mS to 10mS for Channel 2 using potentiometer P2.
JP4	**Fixed/Variable Hold Voltage level** Pins 1 & 2 jumpered: Forces a fixed Hold Voltage level of 12v. Pins 2 & 3 jumpered: Allows adjustment of Hold Voltage level of 5v to 12v using potentiometer P3.

Potentiometers

P1 (PTIME1)	Provides adjustment between 1mS and 12mS for Channel 1 Peak Voltage duration when JP2 has a jumper between pins 2 & 3. Clockwise rotation increases duration.
P2 (PTIME2)	Provides adjustment between 1mS and 12mS for Channel 2 Peak Voltage duration when JP3 has a jumper between pins 2 & 3. Clockwise rotation increases duration.
P3 (HOLDV)	Provides adjustment between 2v and 13v for Hold Voltage level when JP4 has a jumper between pins 2 & 3. Clockwise rotation increases hold voltage level.

Schematic Description

Ground Reference

The ground reference used on this board is isolated from other grounds used in the system. Opto-isolators on the Interface board provide this isolation.

56v Peak Supply

Transformer XF1 supplies 36vac to connector J2, Pins 1 & 2. Bridge rectifier BR2 provides an unregulated 56v for the valve Peak Voltage. A sample of this voltage exits this board via J1, pin 10, to drive the 56vdc coil voltage LED indicator on the front panel.

12v Hold Supply

Transformer XF2 supplies 12vac to connector J2, Pins 4 & 5. Bridge rectifier BR1 provides rectification. Fuse F1 provides over-current circuit protection. Voltage regulator U3 will provide either a fixed 12v Hold Voltage (JP4, pins 1 & 2 jumped), or a variable 5v to 12v (JP4, pins 2 & 3 jumped). A sample of this voltage exits this board via J1, pin 9, to drive the 12vdc coil voltage LED indicator on the front panel.

5v Logic Supply

A 7805 (U4) is supplied from the 12v Hold Voltage. Choke L1 provides current stability during high demands of the Hold Voltage.

Valve Driver Control (Valve 1)

An active-low signal on connector J1, pin 1 triggers 556 timer U2 to begin the Peak Voltage duration timing. The 556 timer active-high output turns on npn transistor Q2, which in turn drives the high current IGFET Q6 to pass the Peak Voltage to the Valve output at connector J3 for a period of 1ms to 5ms. Diode CR5 and capacitor C17 isolate the current demands of this channel from the other channel. Resistor R17 provides a bleed-off path for the charge on capacitor C17 when the VC3500 is turned off.

At the same time that the 556 timer is triggered to begin its timing, npn transistor Q1 is turned on, which in turn drives the high current IGFET Q5 to pass the Hold Voltage to the Valve output at connector J3.

Diodes CR11 and CR12 act as a gate to allow the highest voltage to pass through to the output.

Zener diode CR7 limits the level of the negative voltage spike that occurs when the valve is turned off (due to energy storage). Diode CR8 blocks the effects of a forward-biased zener diode when the output voltage is positive.

Fuse F2 provides over-current circuit protection.

A remote purge button can be connected to connector J3, pin 1 (signal) and pin 2 (return). This signal is fed back to the beginning of the valve driver circuit to manually enable the valve. Filtering of noise spikes due to the capacitive coupling along the glue valve cable into this board's purge circuit is accomplished with a 1kohm resistor connected to 5v and a 0.1uF capacitor connected to ground.

Power Supply Board - 151xx368

(Reference Schematic 999xB151-204)

Service Access Points

Connectors

J1	Connection for transformer secondary voltages to form the dc logic voltages used on other boards.
J2	Connection to supply the 12vdc supply voltage to the LCD/Touchscreen's LED backlight.
J3	Connection to supply the 17vdc supply voltage to the LED board.
J4	Connection to supply the 17vdc supply voltage to the CPU board.
J5	Connection to supply the 17vdc supply voltage to the Interface board and Glue Inspection board (VC3700 only).
J7	Connection to supply the 32vdc supply voltage to the DD-1 Pump.

Replacement Fuses

Function	Label	Type	Value	Valco Number
CPU/LED current limit	F1	5 x 20 mm	3.15A	085xx208
I/O current limit	F2	5 x 20 mm	1.6A	085xx209
DD-1 Pump current limit	F3	5 x 20 mm	1.6A	085xx209

Indicators

D1 (LCD Supply)	When lit, this green LED indicates that the 12 vdc supply voltage is available to light the LED backlight.
D2 (Logic Supply)	When lit, this green LED indicates that the 17 vdc supply voltage is available to power the CPU board.
D3 (Intrfc Supply)	When lit, this green LED indicates that the 17 vdc supply voltage is available to power the Interface board.
D4 (Pump Supply)	When lit, this green LED indicates that the 32 vdc supply voltage is available to power the DD-1 Pump.

Schematic Description

Two isolated DC supplies are provided.

Bridge rectifier BR1 rectifies 14VAC to an unregulated 17VDC. Capacitor C1 provides filtering. Fuse F1 limits the combined current demand from the LED board, CPU board, and LCD/Touchscreen. LED D2 indicates that an unregulated 17 VDC (approximately) is available when illuminated for the LED board, CPU board, and regulator U1. Capacitors C4 & C5 provide input filtering for regulator U1 for better line regulation. Capacitor C3 provides output filtering for regulator U1 for better load regulation. LED D1 indicates that 12VDC for the LCD/Touchscreen is available when illuminated.

Bridge rectifier BR2 rectifies 14VAC to an unregulated 17VDC. Capacitor C2 provides filtering. Fuse F2 limits the current demand from the Interface board. LED D3 indicates that an unregulated 17VDC is available when illuminated. This supply is isolated and used for incoming encoder and scanner signals on the Interface board. Fuse F3 limits the current demand from the DD-1 Pump. Diodes CR3 and CR4, along with capacitors C6 and C7, form a voltage doubler and filter the output at J7 to about 32 vdc.

RS232 Board - 151xx375

(Reference Schematic 999xB151-208)

Service Access Points

Connectors

J1, J2	Connection to the CPU board.
J3	Connection for serial port via ribbon cable.

Jumpers

JP1 **Hardware/Software Handshaking**

Pins 2 & 3 jumpered: Normal configuration. Software handshaking, CTS and RTS connected.

Pins 1 & 2, 3 & 4 jumpered: Not used. Hardware handshaking.

JP2 & JP3 **Cable Type Selection**

Pins 1 & 2 jumpered: Normal configuration. DB9 to DB9 Null Modem Cable.

Pins 2 & 3 jumpered: DB9 to DB25 and special cables.

Note: JP2 and JP3 must be jumpered in the same manner.

Schematic Description

U1 (PAL20V8) contains all address decoding and miscellaneous logic. The PAL equations are included on drawing 999XB151-208.

U3 (NS16C552) is an industry standard Dual UART.

U2 (MAX232A) is a single chip RS232 level converter

Crystal Y1 provides clock timing for U3. 1.84 Mhz is divided down within U3 to provide a Baud rate of 9600 for RS232 communications timing. Other parameters for data transfer are:

Baud Rate	9600
Start Bits	1
Data Bits	8
Stop Bits	1

EPC Board - 151xx379

(Reference Schematic 999xC151-209)

Service Access Points

Connectors

J1	Connection for 12vdc power supply, input analog signal, Intake output signal, and Exhaust/Sensor output signal.

Indicators

CR1 (12v Supply)	When lit, this green LED indicates that the 12 vdc supply voltage is available.
CR2 (Intake)	When lit, this yellow LED indicates that the Intake solenoid is active.
CR3 (Exhaust)	When lit, this yellow LED indicates that the Exhaust solenoid is active.

Jumpers

JP1 (E/S Out)	**Output Signal Select** Pins 1 & 2 jumpered: Makes the E-OUT signal available at J1, pin 5, allowing an external device to monitor the Exhaust solenoid condition. Pins 2 & 3 jumpered: Makes the S-OUT signal available at J1, pin 5, allowing an external device to monitor the Sensor (transducer) analog signal.

Potentiometers

P1 (Span)	Provides adjustment of transducer signal gain, allowing an anticipated small transducer excursion to effect a full scale (0 to 12v) change at TP2.
P2 (Zero)	Provides adjustment for nulling the pressure transducer signal at zero pressure.
P4 (Gain)	Not installed on later models. Provides adjustment of feedback loop gain and affects the hysteresis (and frequency) for switching the Intake and Exhaust solenoids.

Schematic Description

Diode D1 protects the circuit from applying the 12 to 24vdc supply in reverse polarity. Voltage regulator U2 provides a ground reference for the LM324 Op Amps and is 0.7vdc lower than the ground reference supplied by U4 for the analog signals. This difference is due to D2. Voltage regulator U4 provides a 12v supply for the LM324 Op Amps and is 0.7vdc higher than the 12vdc generated by U2 for the analog signals. This scheme allows for quasi "rail-to-rail" Op Amp output signals.

Op Amp U5, output pin 7, buffers the input command signal.

U1 (LM334) is a current source that provides a constant current source for the pressure transducer.

Op Amp U3, output pins 7 & 8, buffers the pressure transducer signal and offers some gain adjust with the SPAN pot (P1). Op Amp U3, output pins 1 & 14, provides zero adjustment with the ZERO pot (P2).

Op Amp U5, output pin 8, compares the buffered input command signal with the buffered transducer signal. The GAIN pot (P4) provides adjustment of feedback loop gain and affects the hysteresis (and frequency) for switching the Intake and Exhaust solenoids.

Op Amp U5, output pin 1, controls the Intake solenoid.

Op Amp U5, output pin 14, controls the Exhaust solenoid.

Relay Board - 151xx404

(Reference Schematic 999xA151-220)

Service Access Points

Connectors

J1	Connection to drive Machine Interface relay from either J6 of the Interface board (151xx366) or J1 of the Glue Inspection board (151xx410).
J2	Connection to supply beacon and alarm signals from the Glue Inspection board (151xx410).
J3	External connector used for interfacing the Machine Interface relay to the parent machine stop circuit.
J4	External connector used for interfacing a Beacon/Alarm for Jam and Glue Fault conditions.

Indicators

D1 (RLY)	When lit, this yellow LED indicates that the Machine Interface relay is energized.

Replacement Fuses

Function	Label	Type	Value	Valco Number
Beacon current limit	F1	PC Mount	3A	085xx207

Schematic Description

Diode CR1 provides flyback voltage protection due to relay RL1. Varistors V1 and V2 provides suppression of contact arcing for relay RL1.

Glue Inspection Board - 151xx410 (VC3700 Only)

(Reference Schematic 999xD151-219)

Service Access Points

Connectors

J1 (MSTOP)	Connection to drive Machine Interface relay on Relay board (151xx404).
J2 (INDICTRS)	Connection to supply beacon and alarm signals to Relay board (151xx404).
J3 (KCK-VLV)	Connection to drive a spray marker, kicker, or diverter for rejected products.
J4 (MARK-SCAN)	Not Used.
J5 (Scanner 1)	Connection for product scanner used to initiate glue inspection for Channel 1.
J6 (Scanner 2)	Connection for product scanner used to initiate glue inspection for Channel 2.
J7 (Glue 1)	Connection for Glue Inspection Sensor for Channel 1.
J8 (Glue 2)	Connection for Glue Inspection Sensor for Channel 2.
J9	Connection to LED board via a 10 pin ribbon cable.
J10	Connection to CPU board via a 20 pin ribbon cable.
J11	Connection for 17 VDC supply voltage from the Power Supply board.

Indicators

D1 Multi-segment LED indicator:

MSTOP	When lit, this segment indicates that the Machine Stop signal relay is active.
HORN	When lit, this segment indicates that the alarm/horn signal is active.
JAM	When lit, this segment indicates a Jam condition exists.
G-FLT	When lit, this segment indicates the previous product had a glue inspection fault.
KICK	When lit, this segment indicates that the marker/kicker/diverter driver is active.
SCN1	When lit, this segment indicates that the scanner for Glue Inspection Channel 1 senses product.
SCN2	When lit, this segment indicates that the scanner for Glue Inspection Channel 2 senses product.
GLU1	When lit, this segment indicates that the glue sensor for Glue Inspection Channel 1 senses glue.
GLU2	When lit, this segment indicates that the glue sensor for Glue Inspection Channel 2 senses glue.

D2 (12V) When lit, this green LED indicates that the 12 vdc supply voltage is available for I/O devices.

Replacement Fuses

Function	Label	Type	Value	Valco Number
Marker/Kicker current limit	F1	PC Mount	0.75A	085xx215
I/O current limit	F2	PC Mount	3 A	085xx207

Jumpers

JP1 Horn Activation Function
Pins 1 & 2 jumpered: Horn activated for Glue Fault and Jam Fault.
Pins 2 & 3 jumpered: Horn activated for Glue Fault only.

JP2 **Glue Fault Signal Duration (seconds)**

JP2A	JP2B	JP2C	Time
			1.0 s
		installed	0.5 s
	installed		0.3 s
installed			0.2 s

JP4 (Irton Data) Engineering Use Only.
JP5 (Serial Comm) Engineering Use Only. When jumper installed, diagnostic data is available at JP4.
JP6 Future.
JP7 Channel 1 Rear Flap Check
Pins 1 & 2 jumpered: Enabled (normal configuration)
Pins 1 & 3 jumpered: Disabled (useful if a capacitive sensor is used with a large sensing area).
JP8 (Test) Channel 2 Rear Flap Check
Pins 1 & 2 jumpered: Enabled (normal configuration)
Pins 1 & 3 jumpered: Disabled (useful if a capacitive sensor is used with a large sensing area).
JP9 (Test) Engineering Use Only. When jumper installed, diagnostic data is available at JP7 & JP8.

Schematic Description

Ground Reference

The ground reference used on this board for scanner and glue sensor inputs is isolated from other grounds used in the system. Opto-isolators on this board provide this isolation.

Scanner and Glue Sensor Inputs

A 12 VDC on-board regulator provides an isolated power source for scanners, glue sensors, Machine Stop signal, Glue Light signal, Jam Light signal, Horn signal, and Kicker/Marker signal. Scanner 1 and 2 (Product Sensor) and Glue Sensor 1 and 2 signals should have open-collector, active low outputs. These signals are optically-coupled to logic circuits referenced to digital ground (symbol denoted by an open triangle). These logic signals are then transferred to the Glue Inspection Channel Logic I.C.'s U10 and U11 for signal processing.

Glue Inspection Master Logic

U9 (87C51) provides the interface between the CPU board and the Glue Inspection Channel Logic I.C.'s. It also controls any common outputs such as Machine Stop, Glue Light, Jam Light, Horn, and Kicker/Marker signals. This chip may me monitored by first installing JP5 to enable serial communications, then attaching an Irton data display to connector JP4. Pattern data from the CPU board is input into the first five pins of Port 1 (signals JP/SL0, JP/SL1, JP/SL2, JP/SL3, JP/SL4). Other signals used by this I.C. from the CPU board are MIN_SPD and ENCODER.

Glue Inspection Channel Logic

U10 (87C51) provides the Glue Inspection Channel Logic function for Channel 1. U11 (87C51) provides the Glue Inspection Channel Logic function for Channel 2. Product Sensor and Glue Sensors are inputs to these devices. Pass and Fail LED's located on the front panel for each channel are controlled by these devices. Glue parameters are received from the CPU board via the Glue Inspection Master Logic IC (U9).

Output Activation Time

A 555 one-shot timer circuit (U8) provides the timing to make signals active such as Glue Light and Horn. JP2 jumper positions determine the length of time these signals are active. See chart above.

Operation Notes

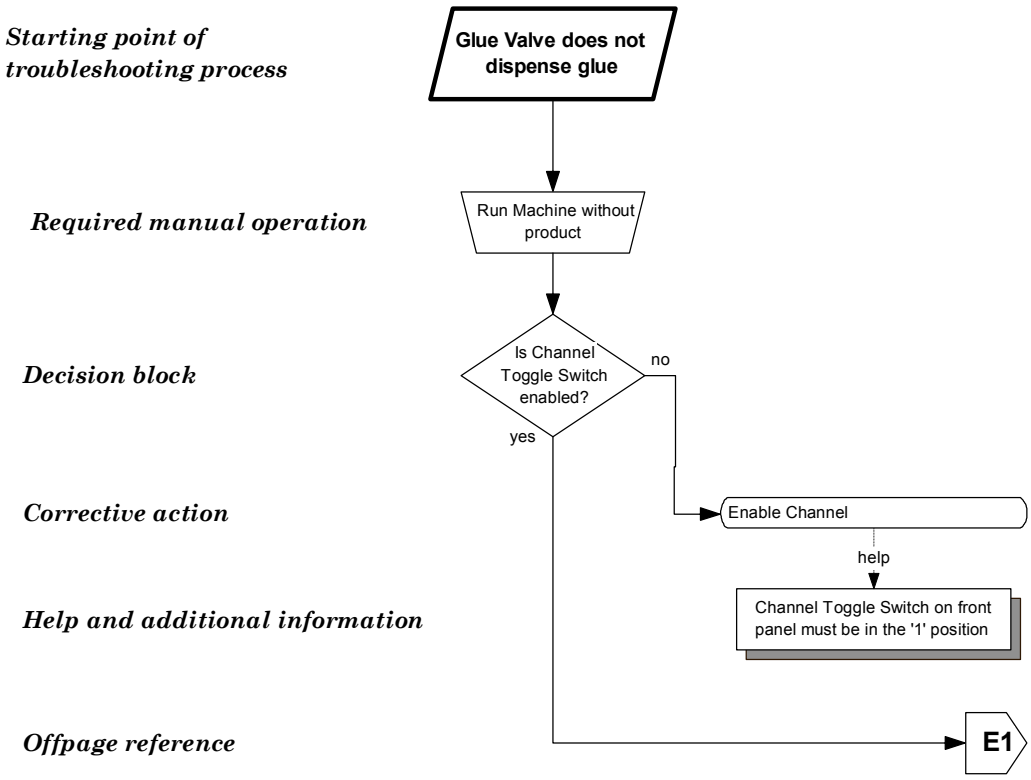
PIN Access

The customer may select one 4-digit PIN to restrict access to menu levels 3 and higher. The proprietary PIN available for Valco personnel use only is a 6-digit code: 362436.

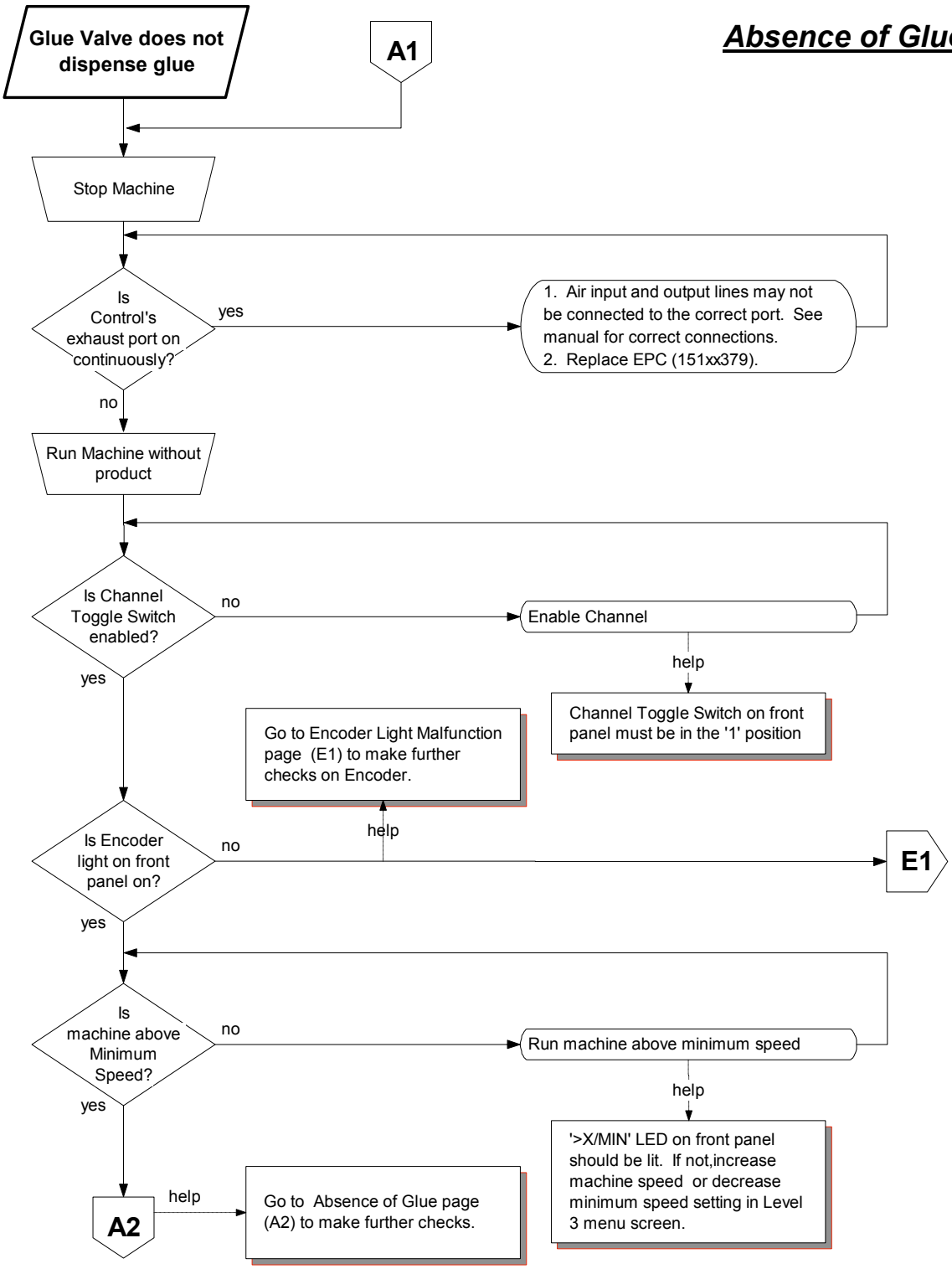
Troubleshooting Flow Chart

Malfunction Description	*See Section*
Absence of Glue	A
Bypass Valve	B
DD-1 Pump	D
Encoder Light	E
Front Panel	F
Glue Volume	G
Glue Inspection	I
Jam	J
Machine Stop	M
Pattern Placement	P
Scanner Light	S
Warning Beacon	W
EPC Adjustment	X
Analog Board Adjustment	Y

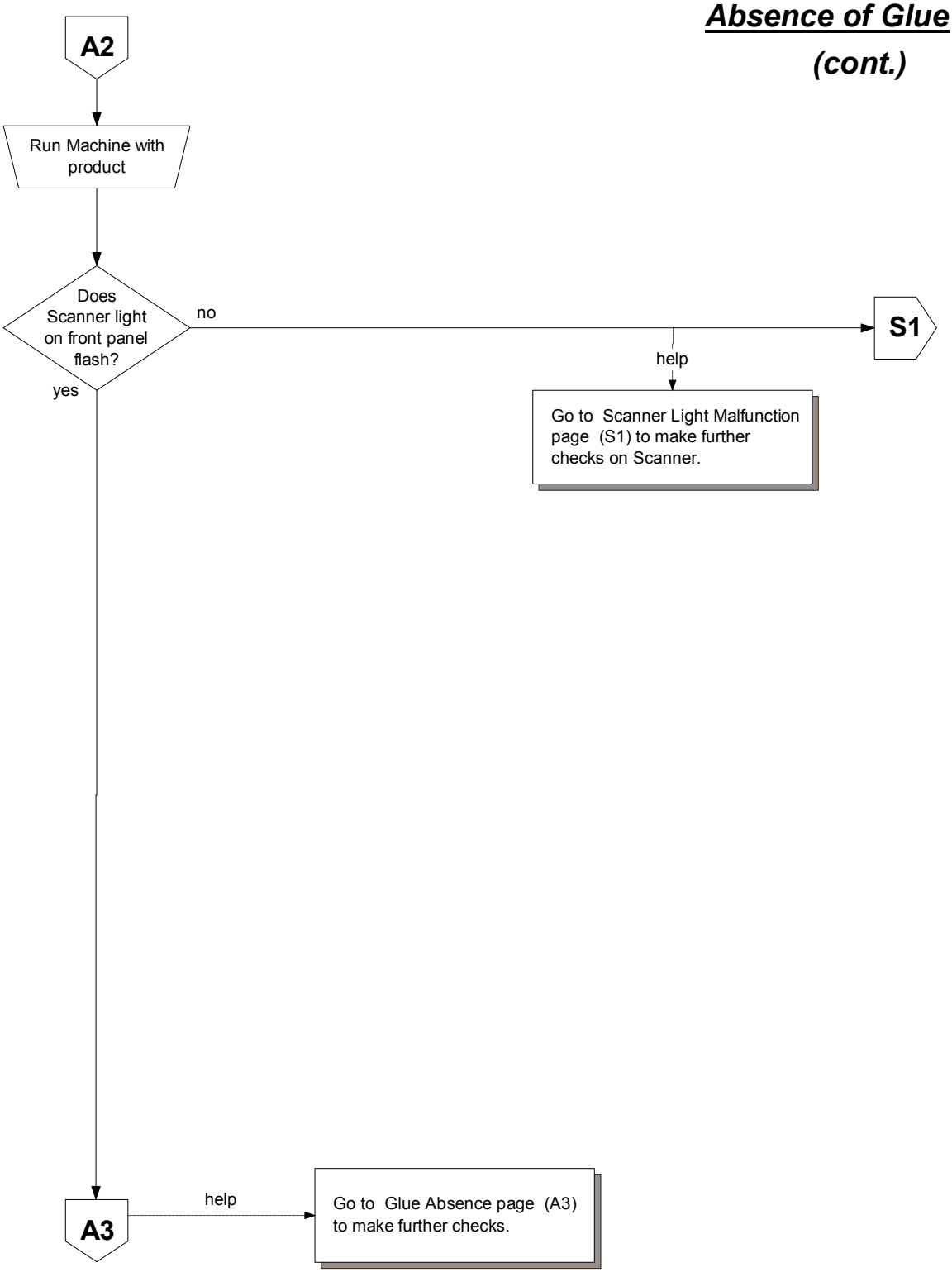
Symbol Key


Starting point of troubleshooting process
Glue Valve does not dispense glue
Required manual operation
Run Machine without product
Decision block
Is Channel Toggle Switch enabled?
no
yes
Corrective action
Enable Channel
help
Help and additional information
Channel Toggle Switch on front panel must be in the '1' position
Offpage reference
E1

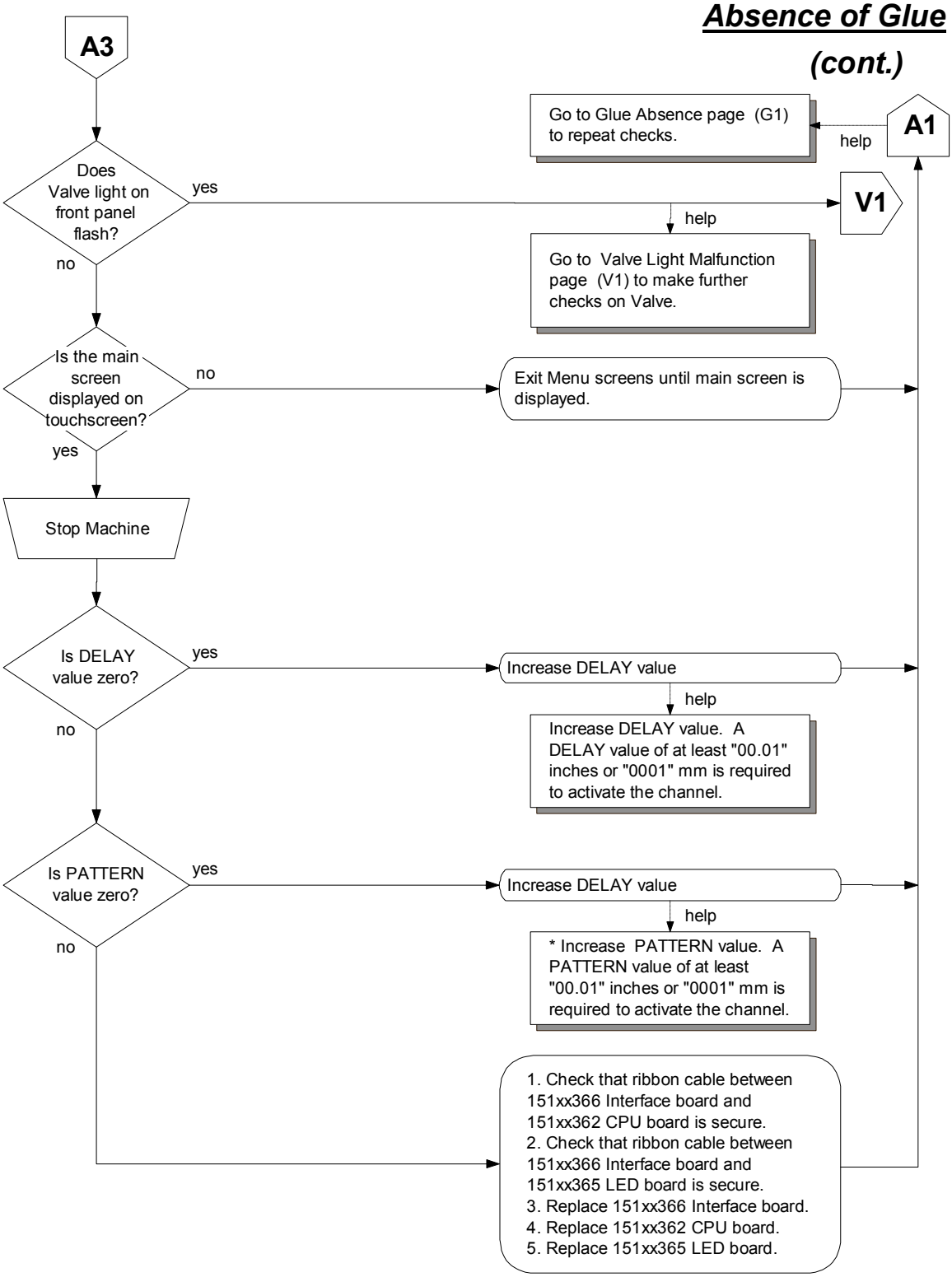
Absence of Glue



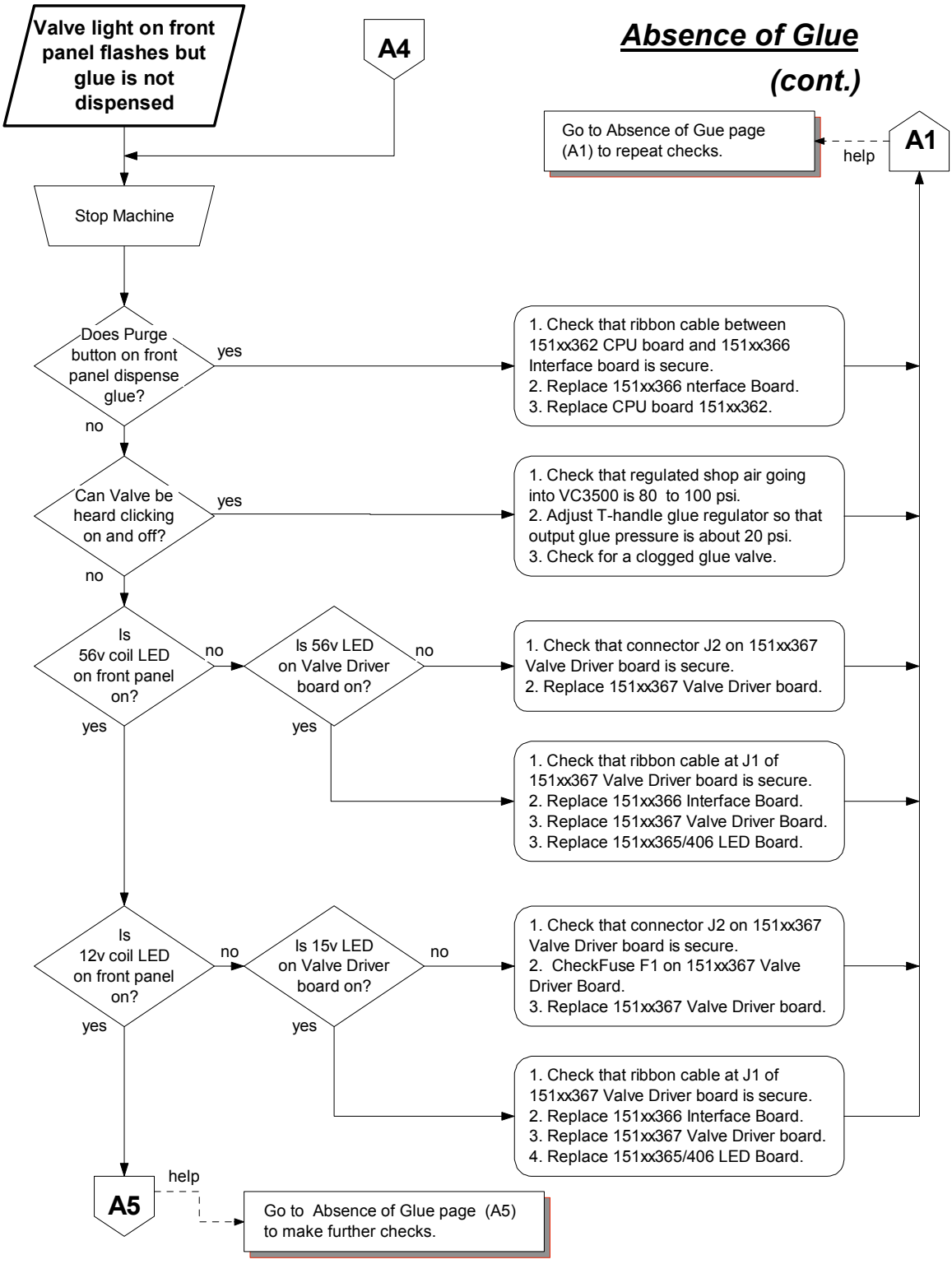
Absence of Glue (cont.)



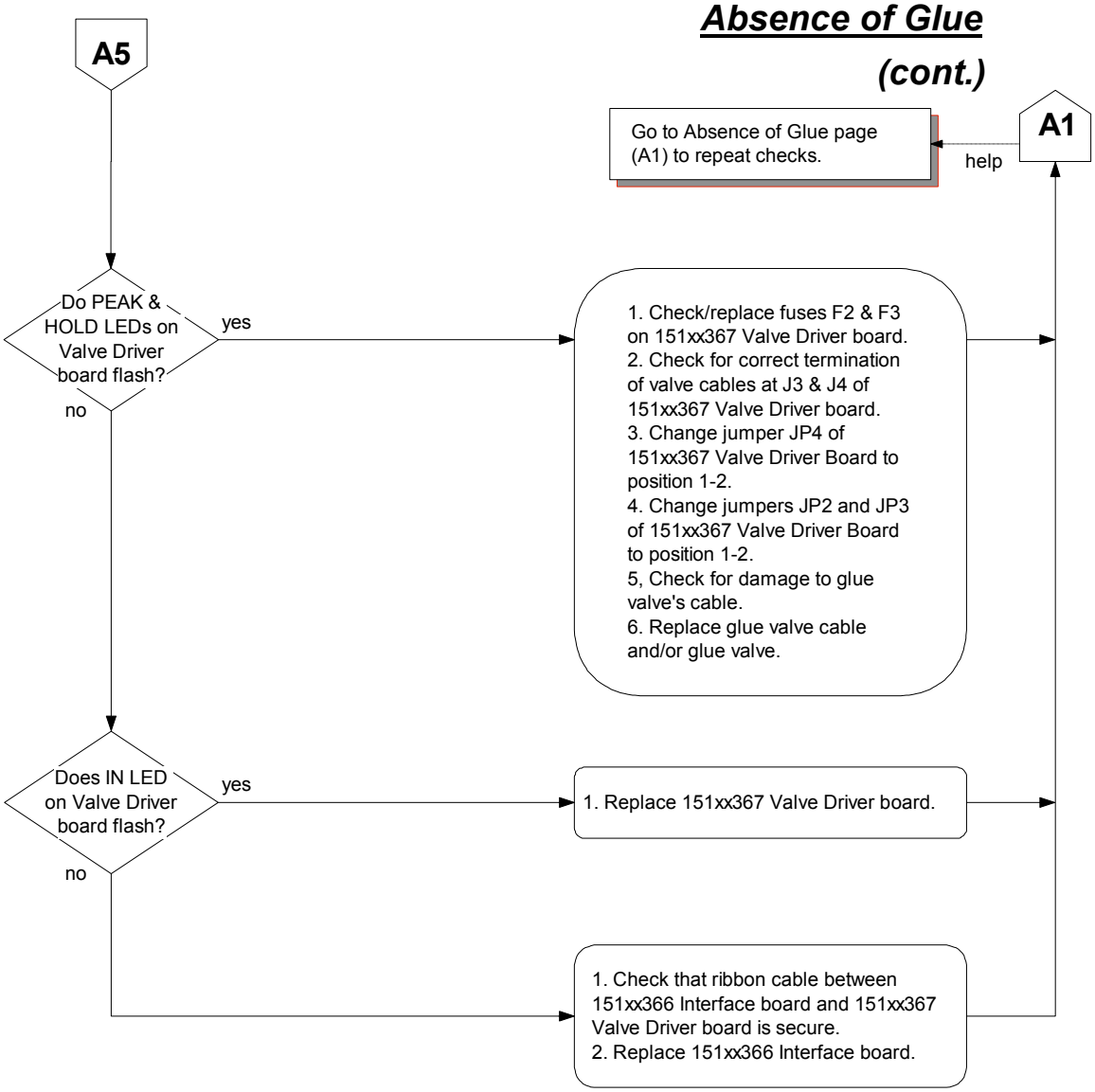
Absence of Glue (cont.)



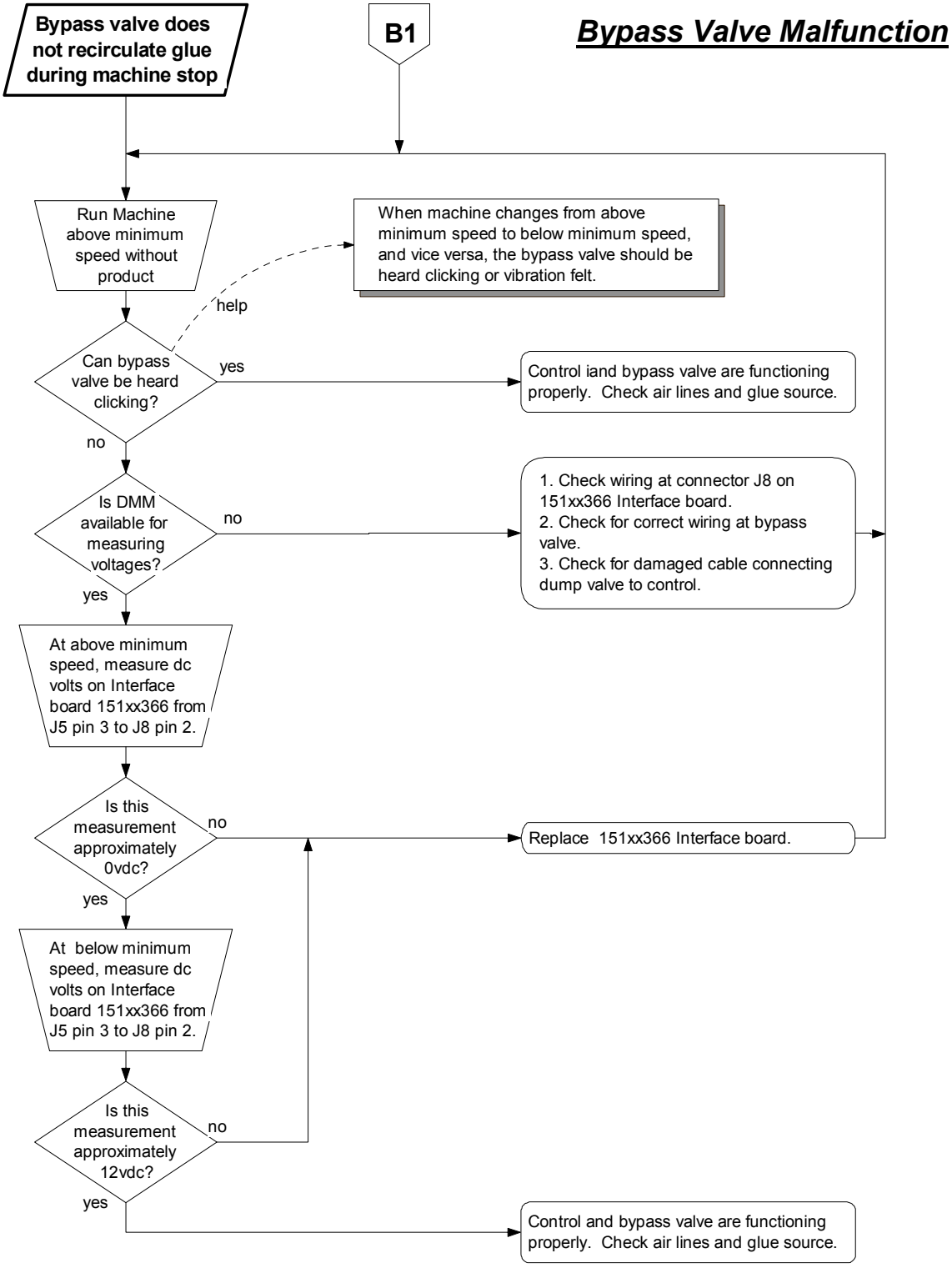
Absence of Glue (cont.)



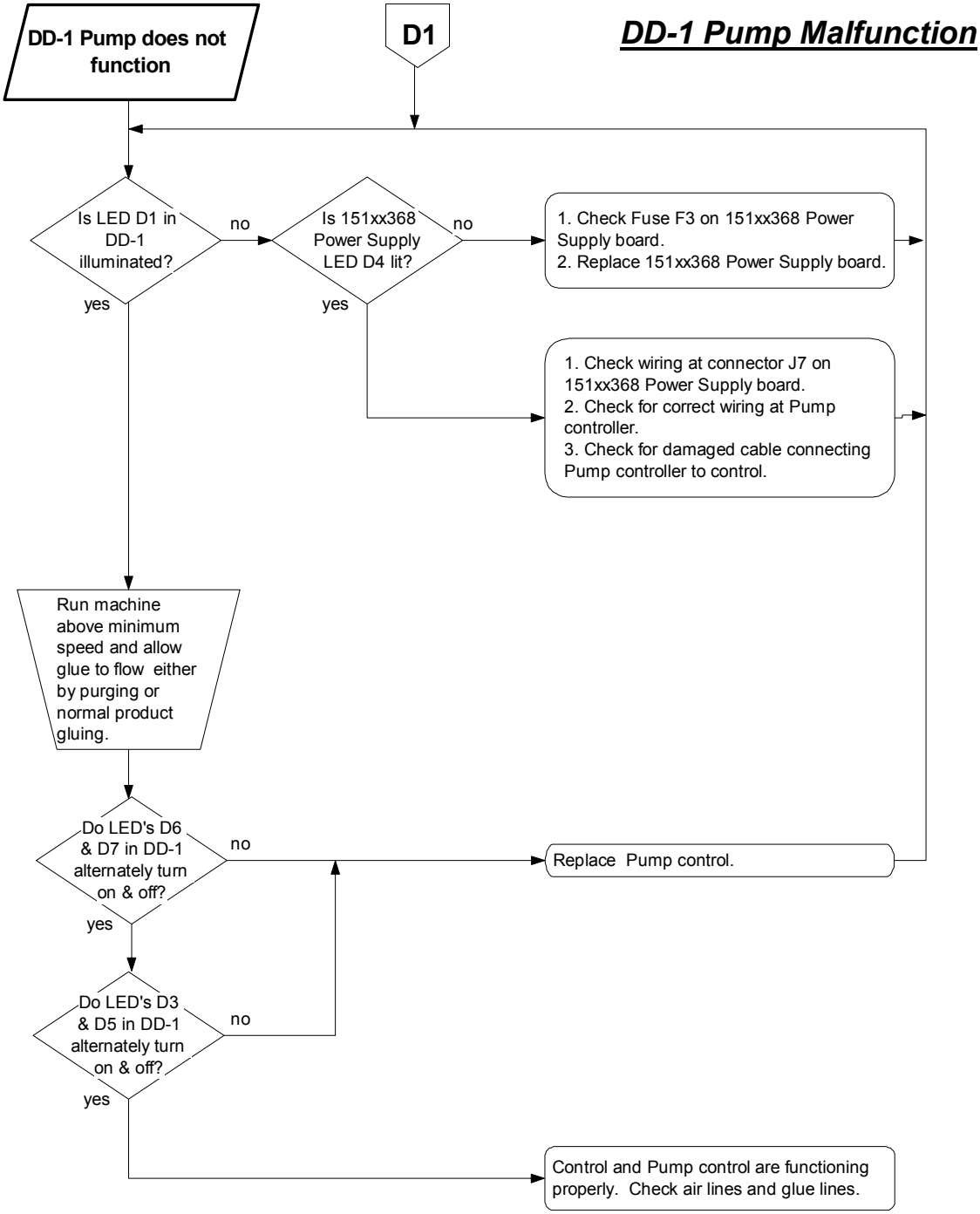
Absence of Glue (cont.)



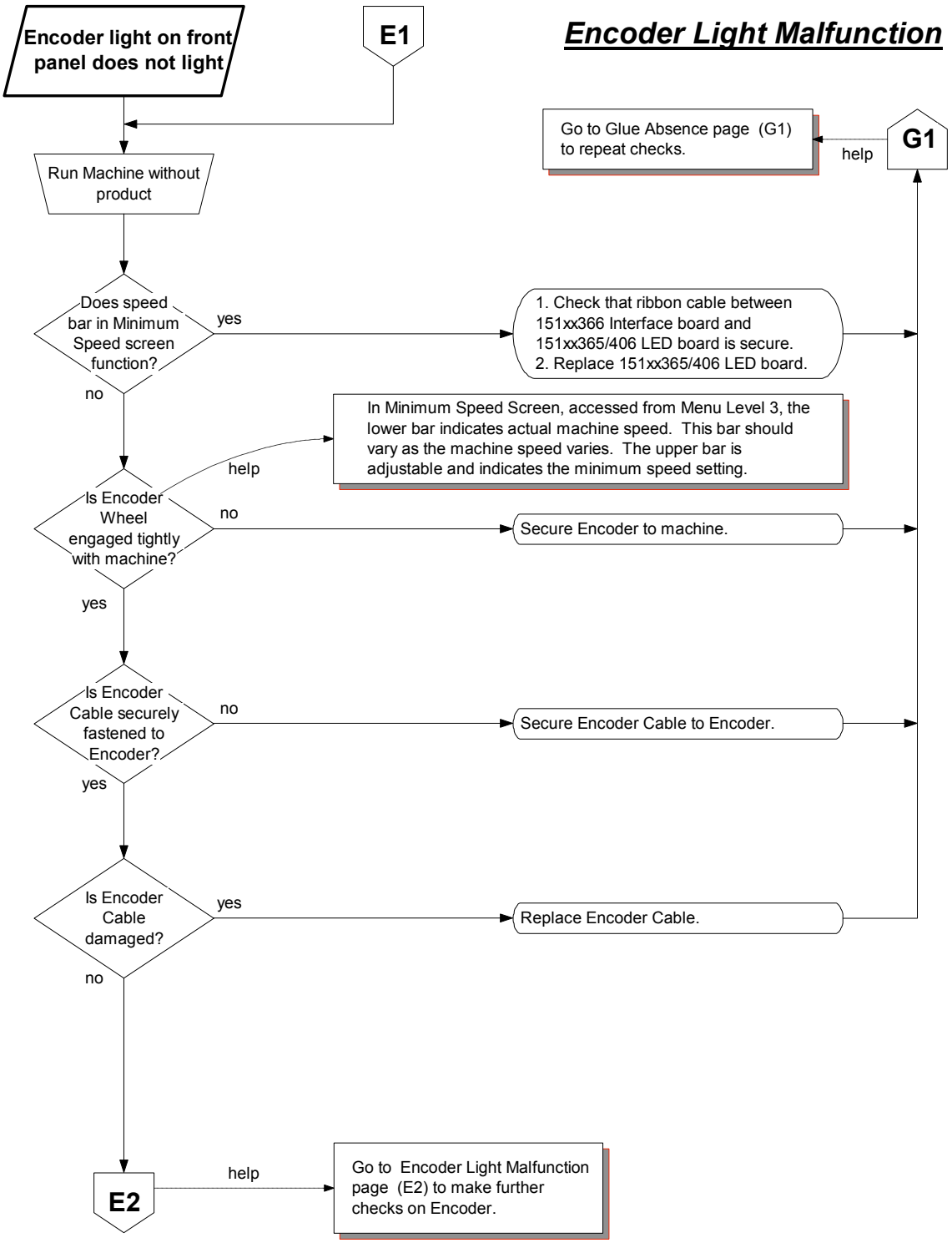
Bypass Valve Malfunction



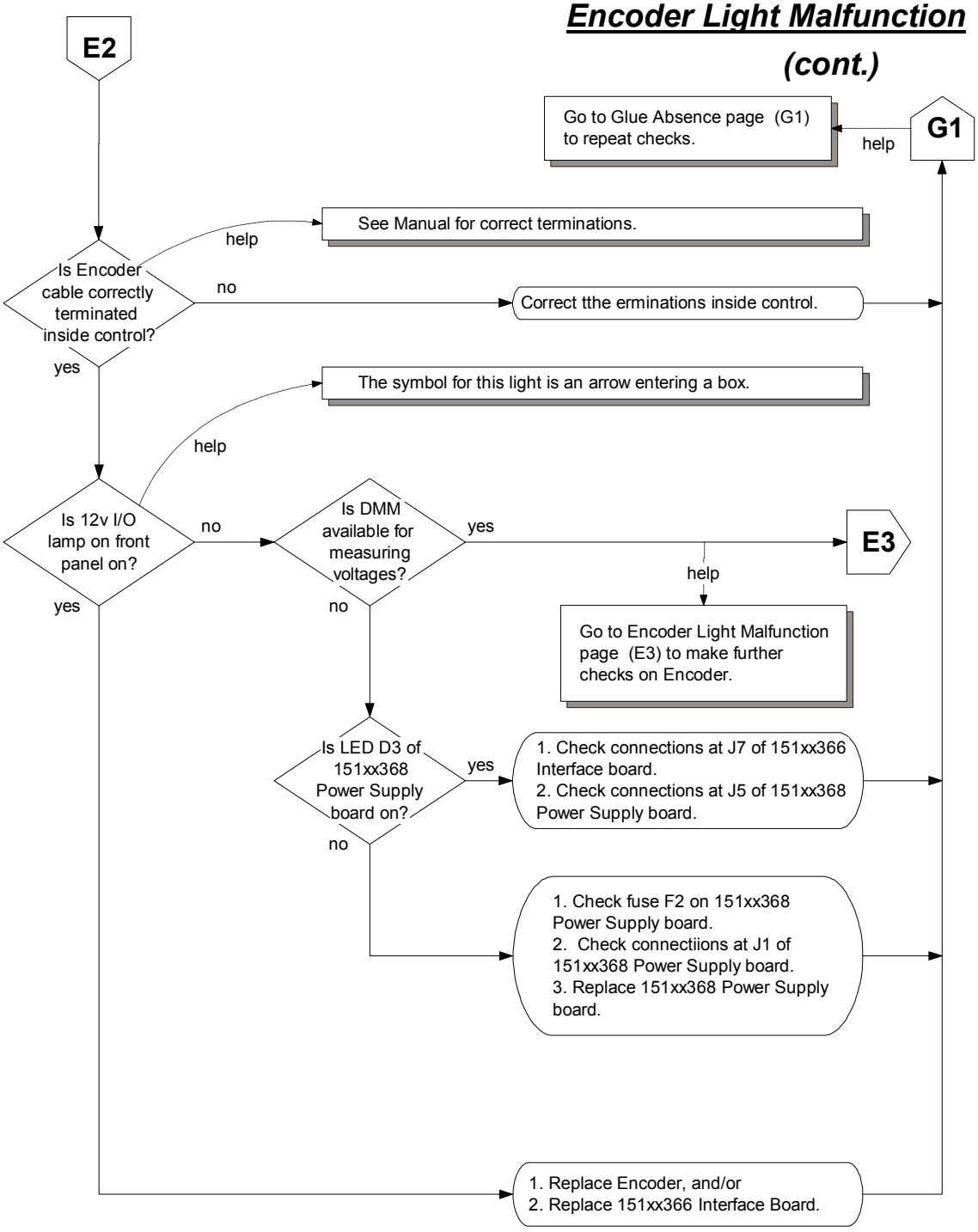
DD-1 Pump Malfunction



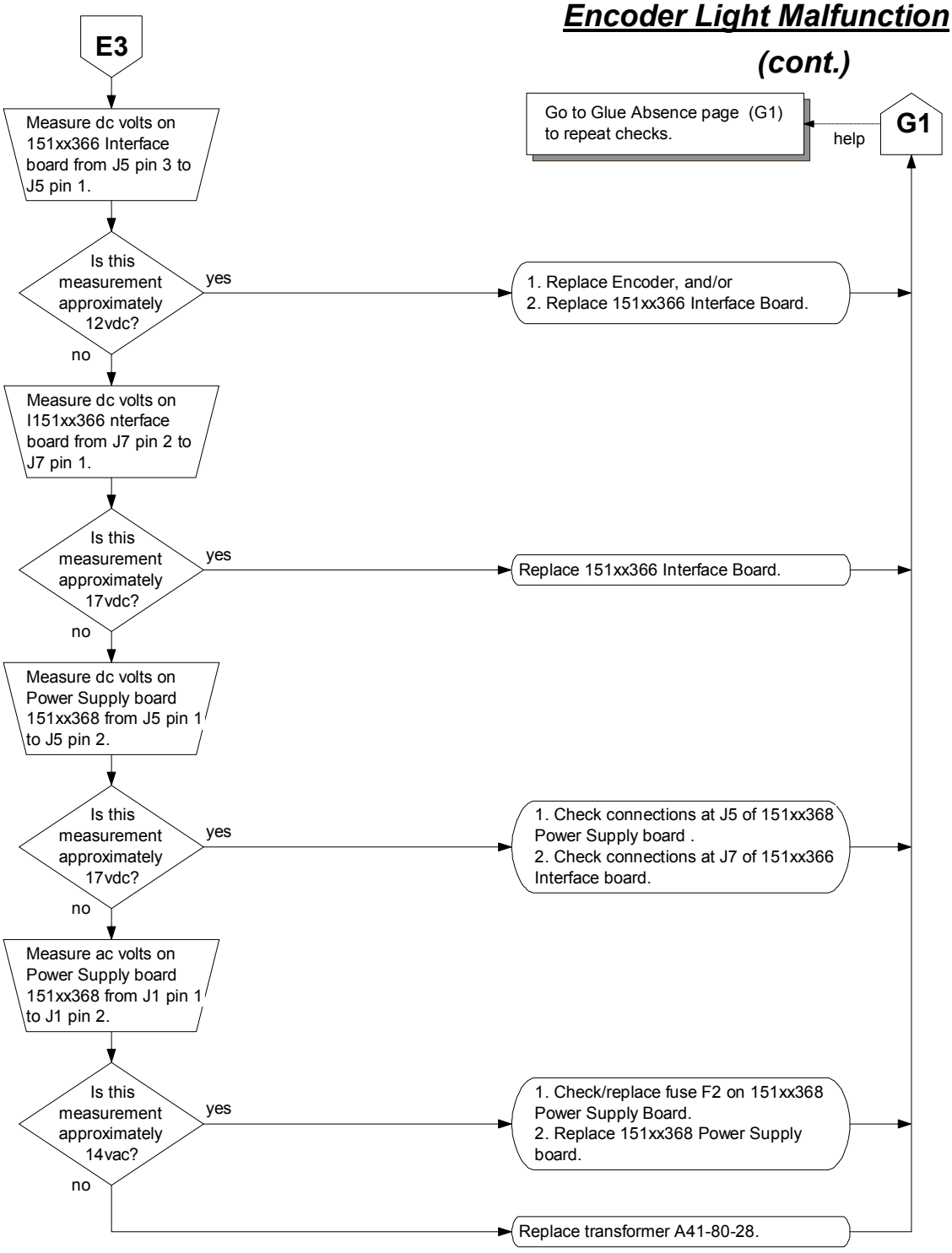
Encoder Light Malfunction



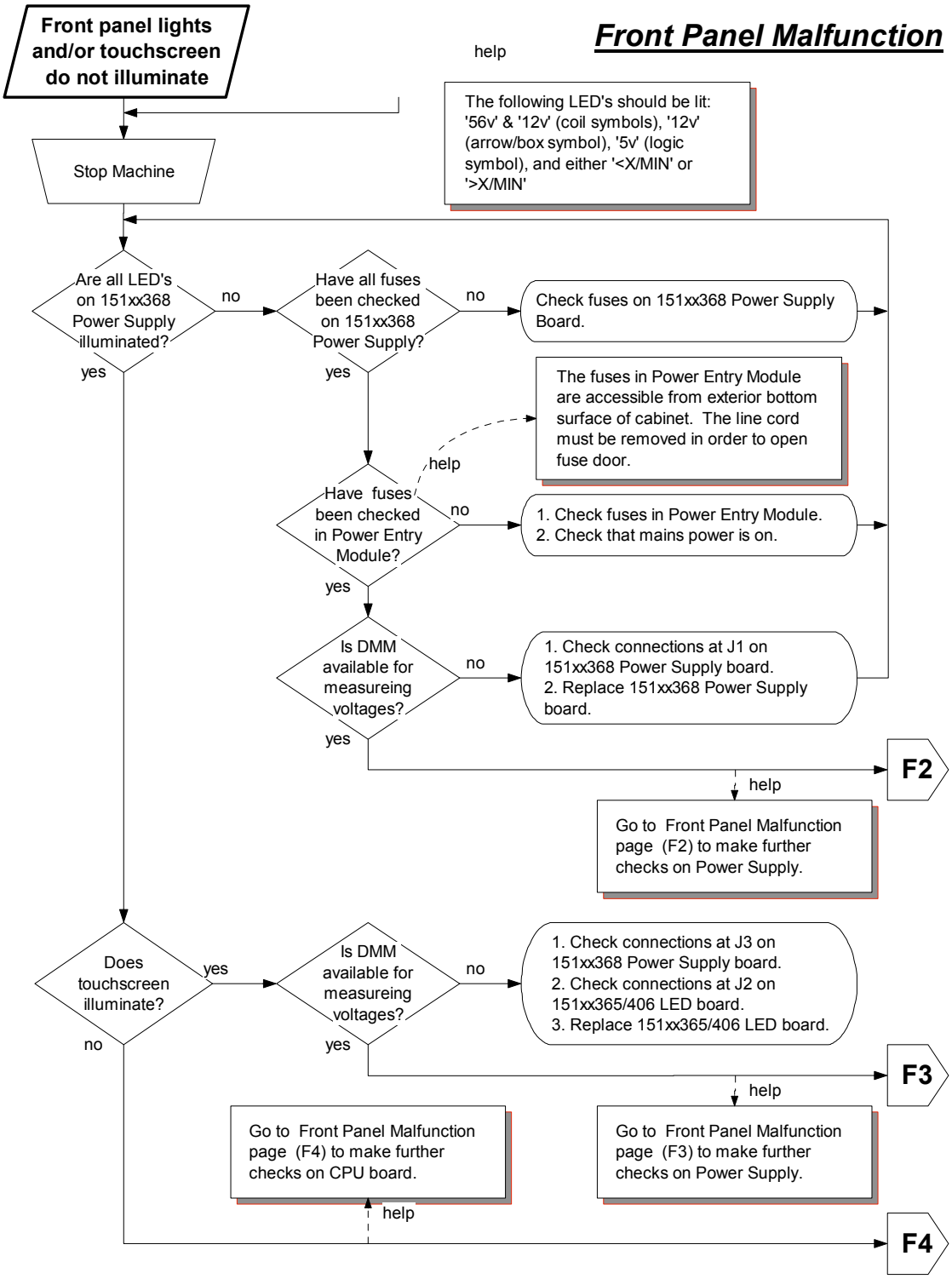
Encoder Light Malfunction (cont.)



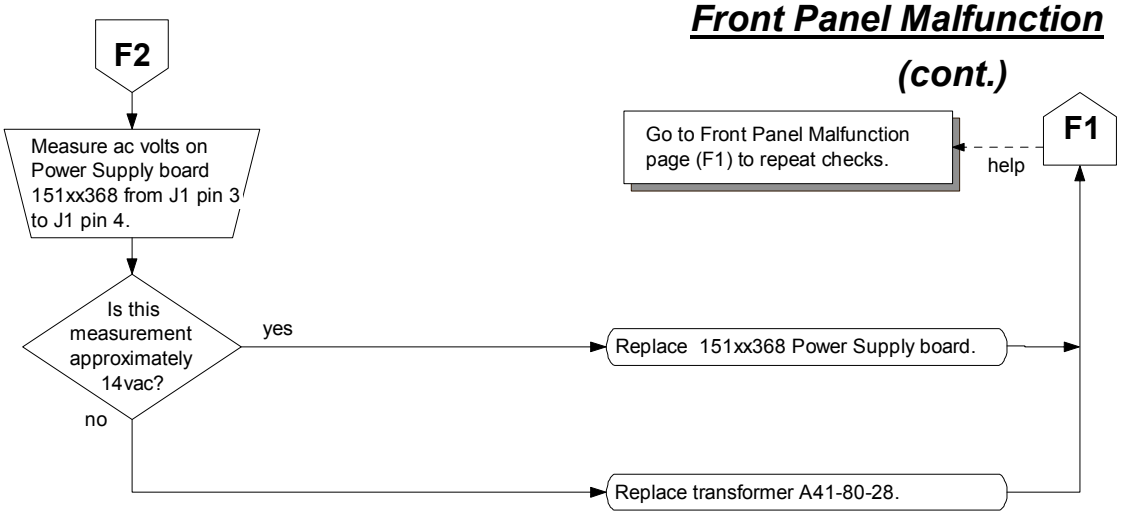
Encoder Light Malfunction (cont.)



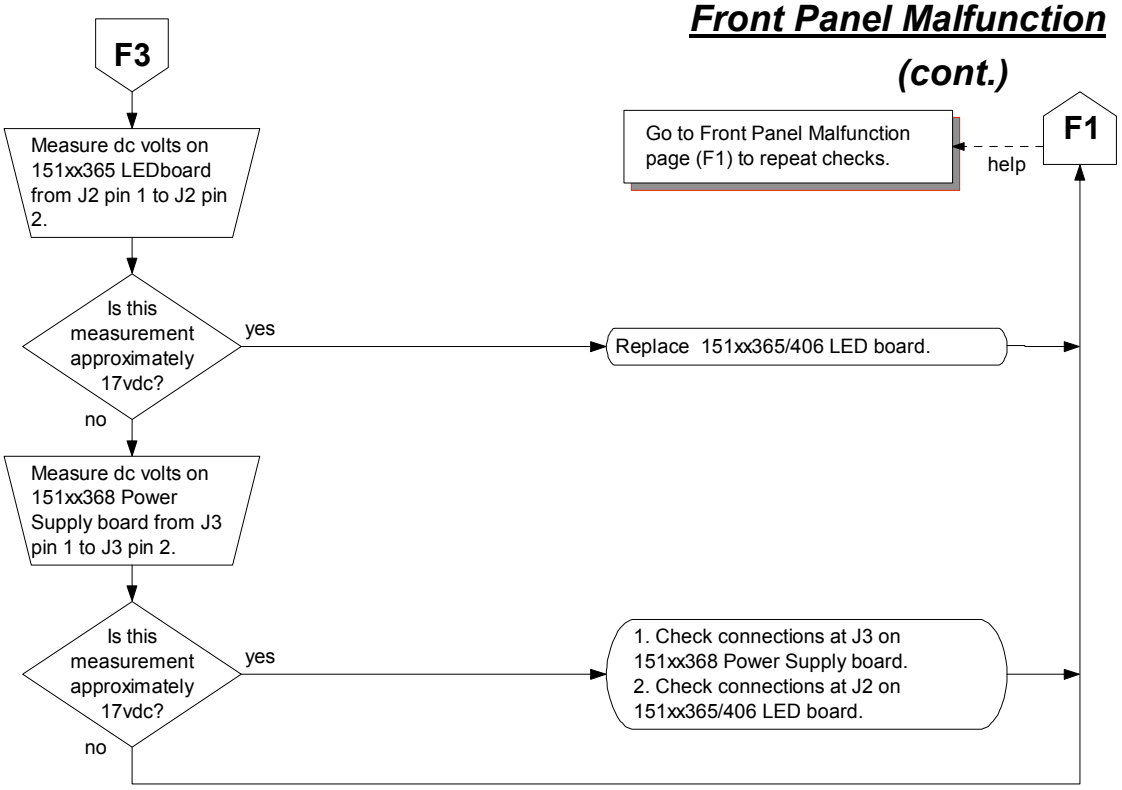
Front Panel Malfunction



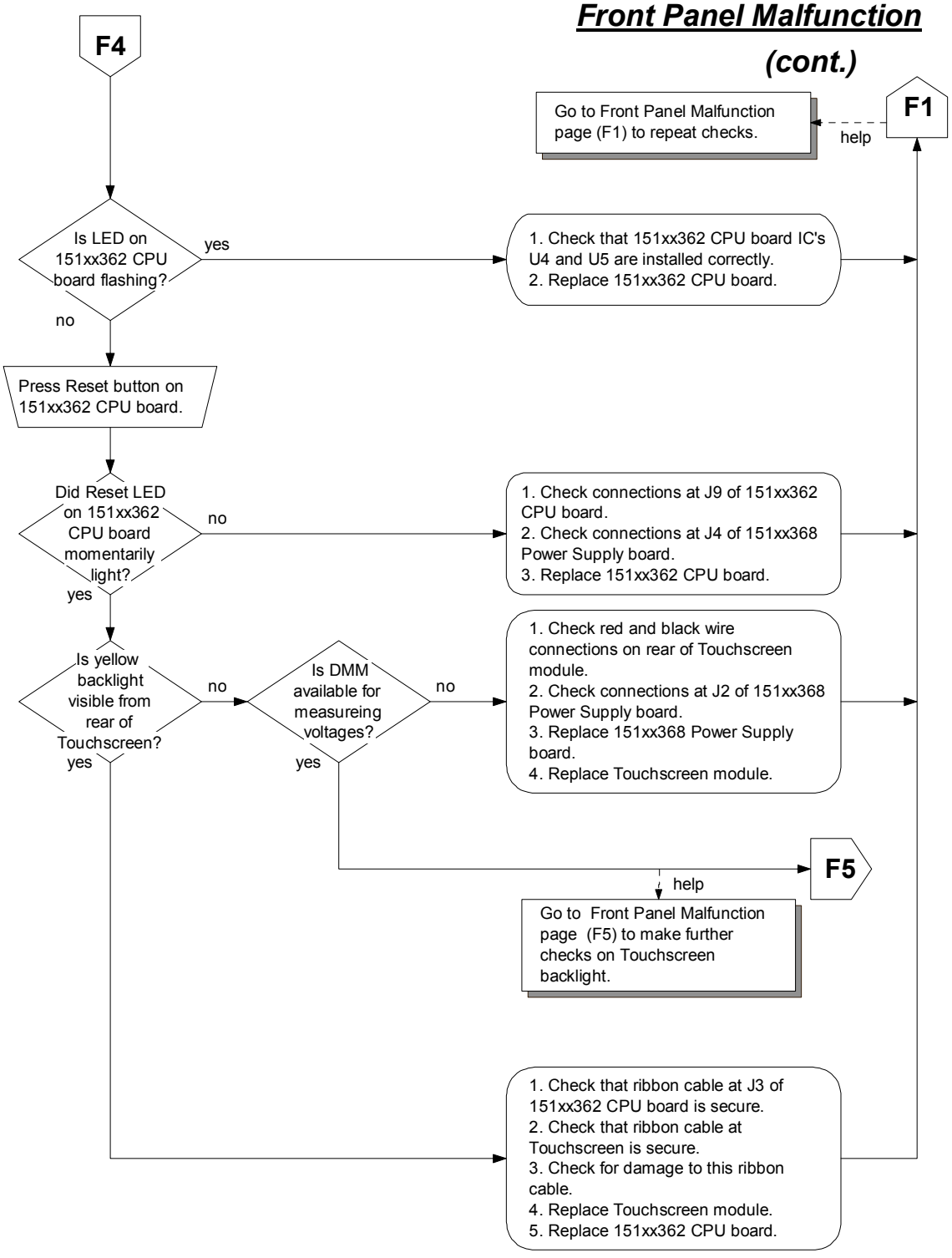
Front Panel Malfunction (cont.)



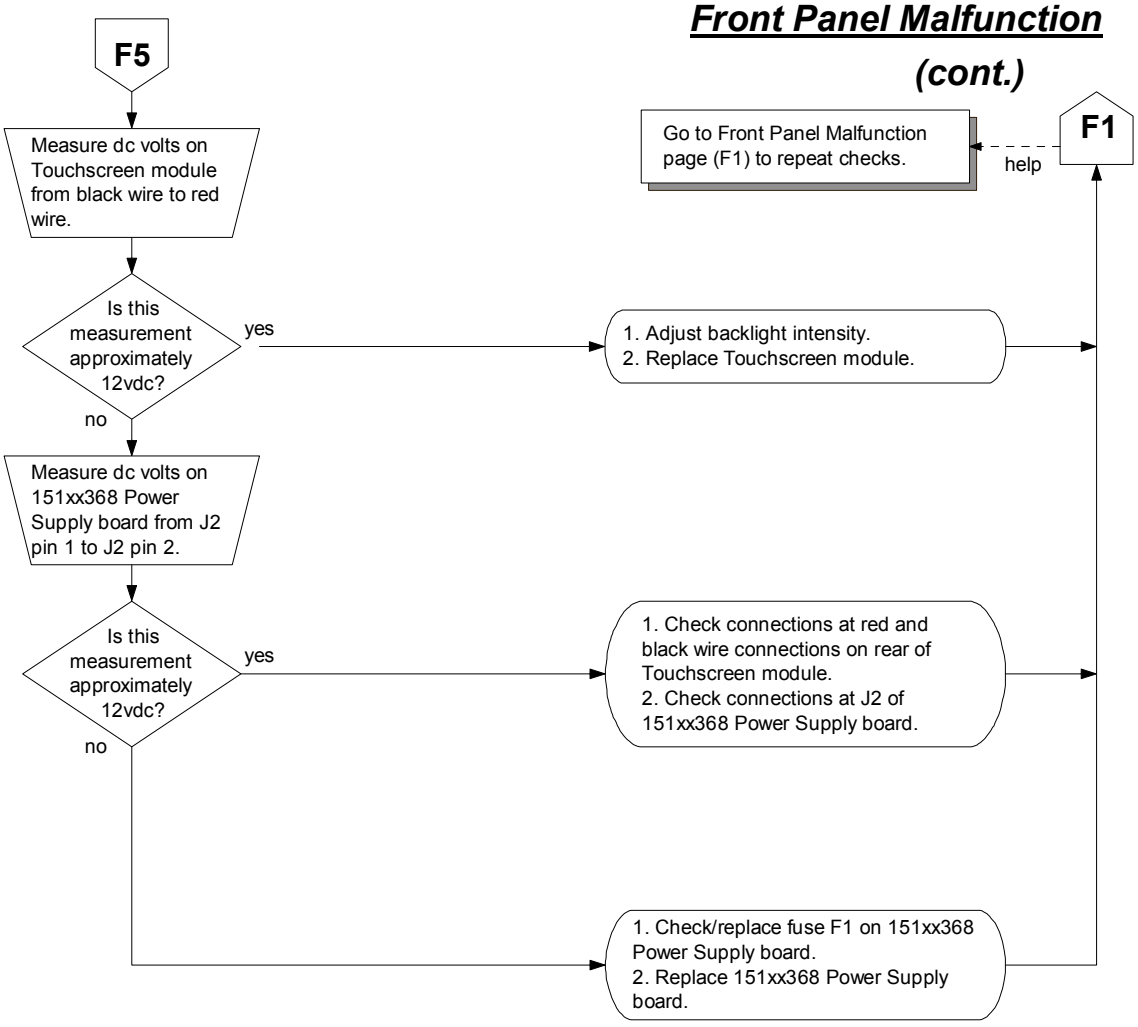
Front Panel Malfunction (cont.)



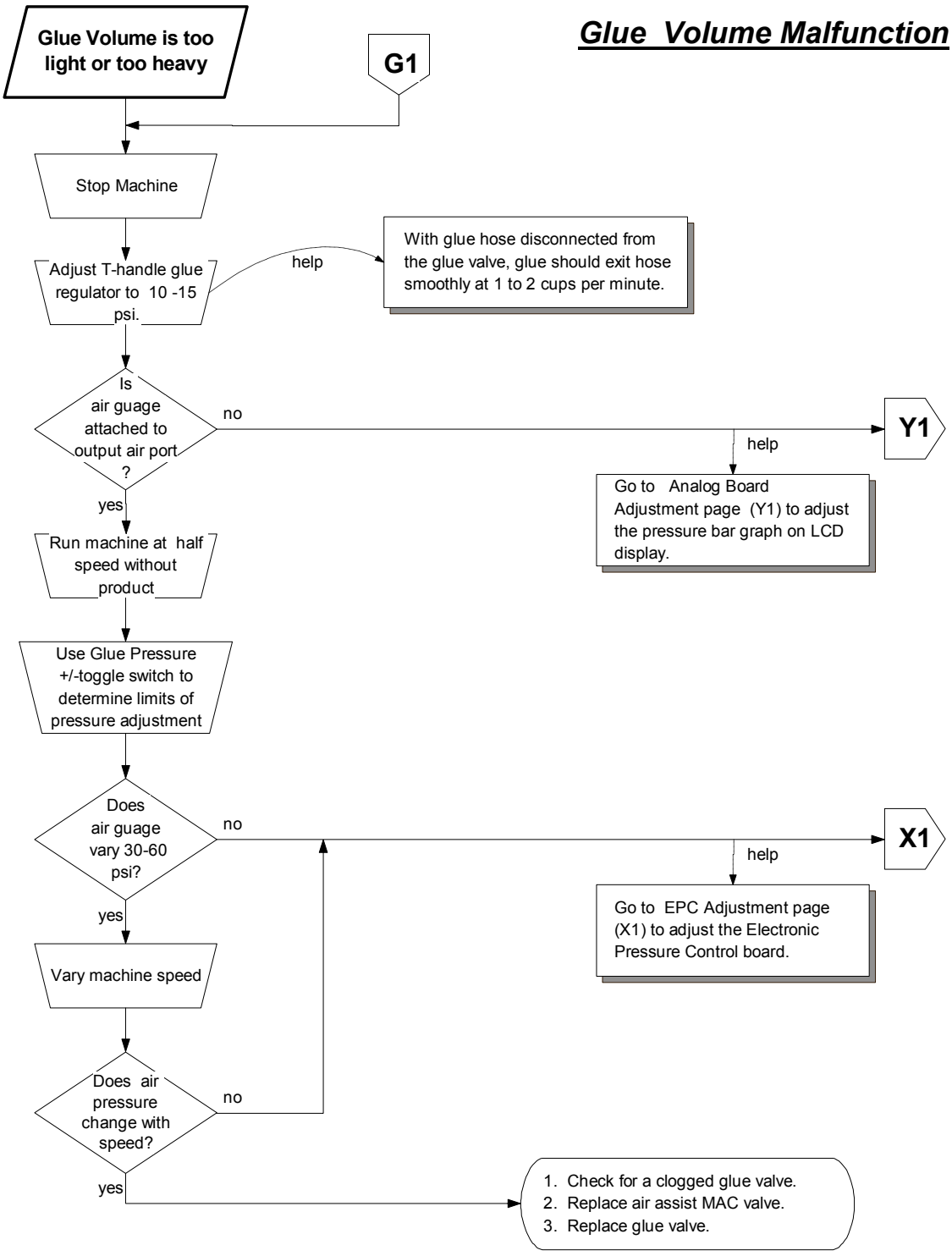
Front Panel Malfunction (cont.)



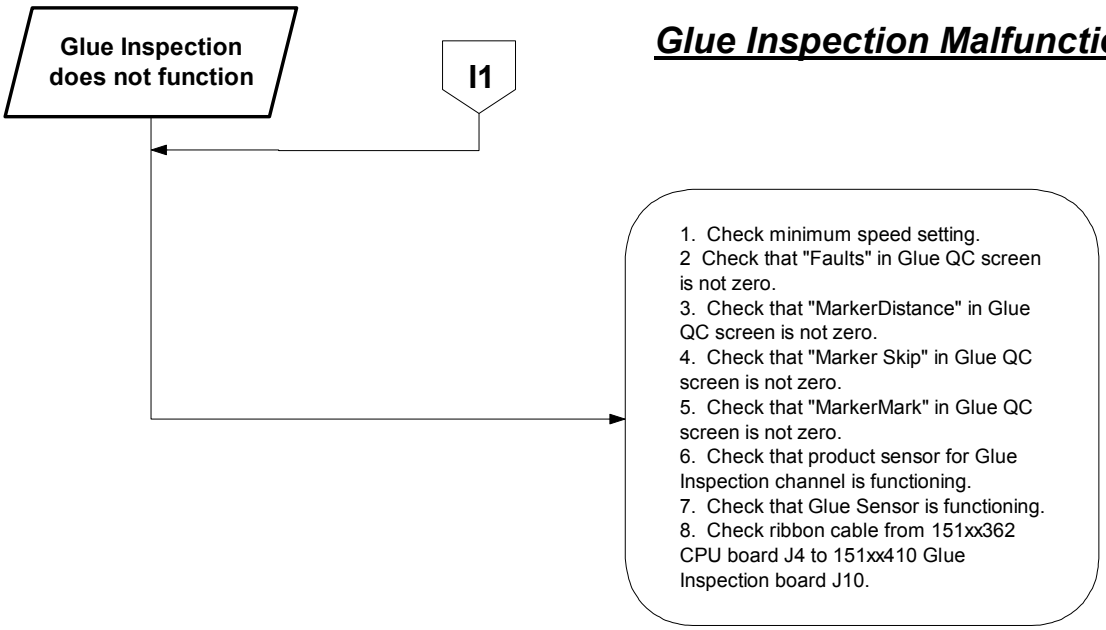
Front Panel Malfunction (cont.)



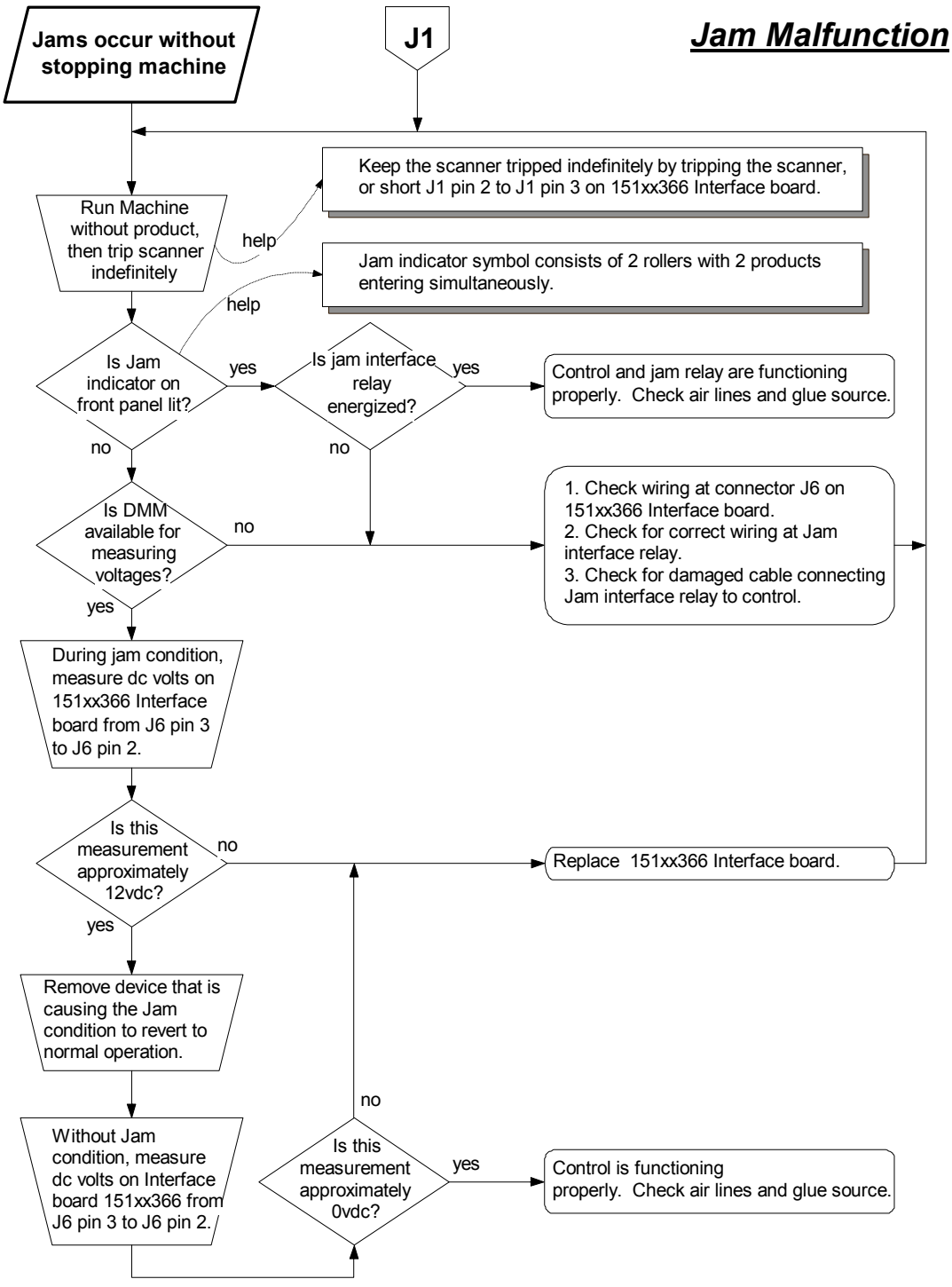
Glue Volume Malfunction



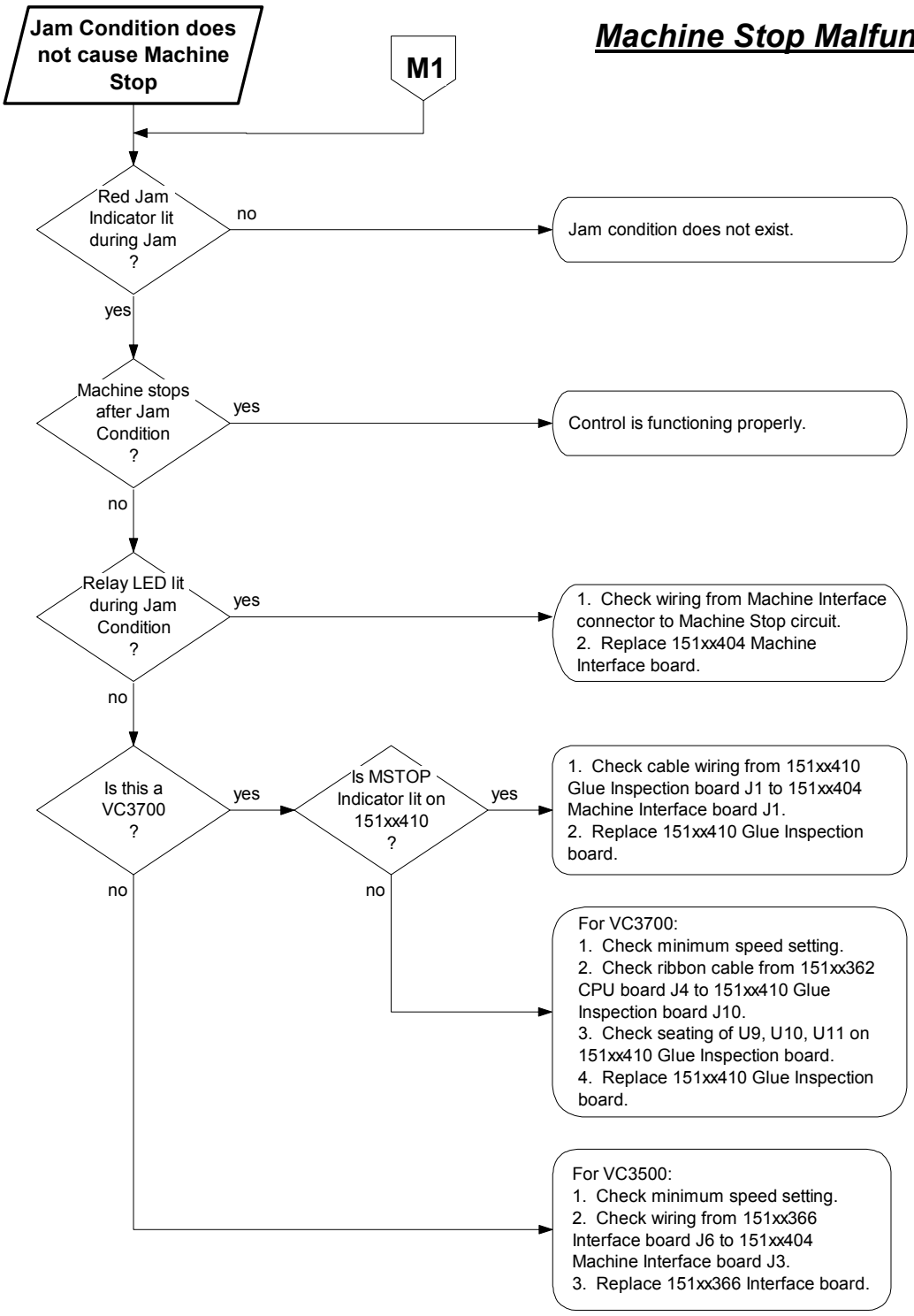
Glue Inspection Malfunction



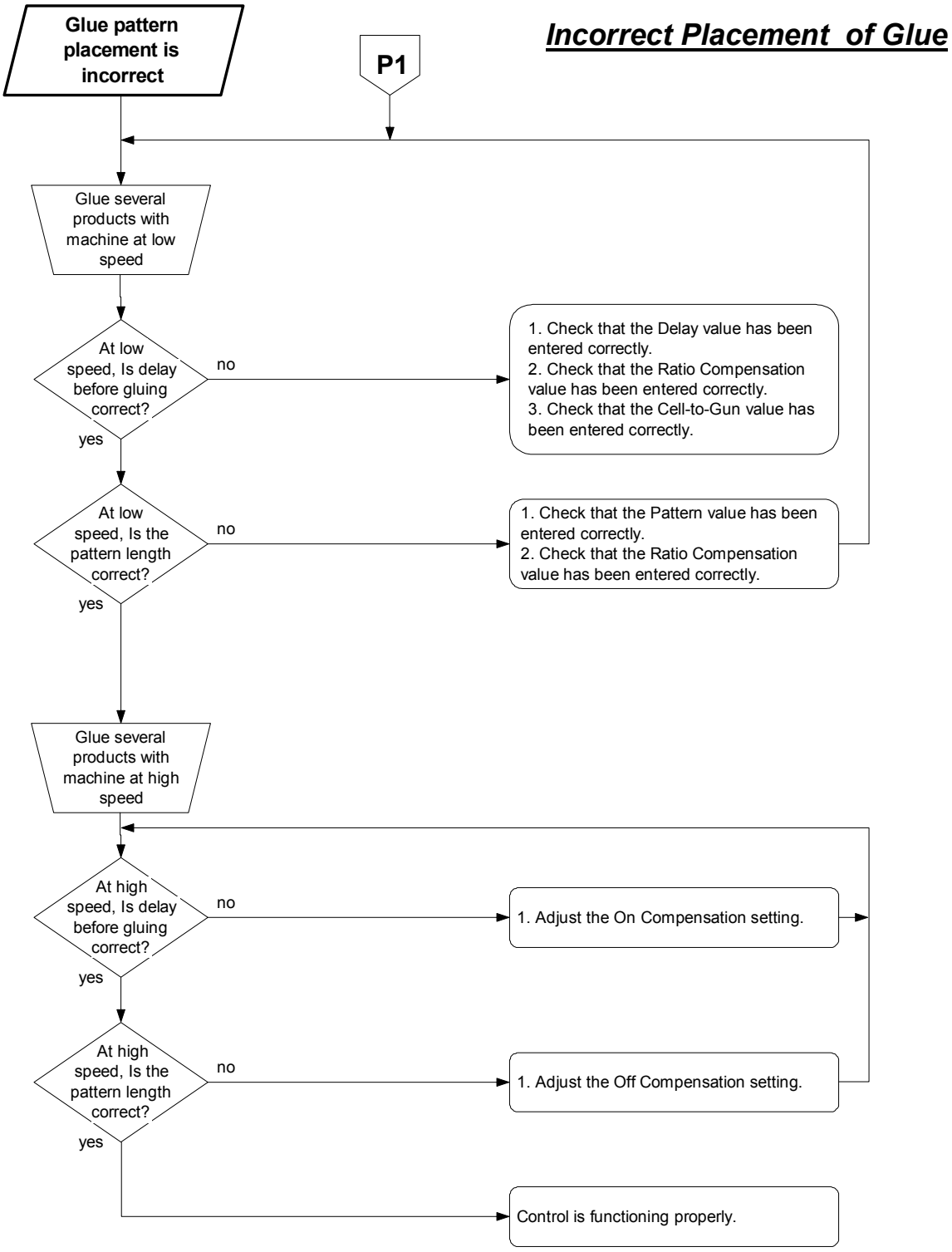
Jam Malfunction



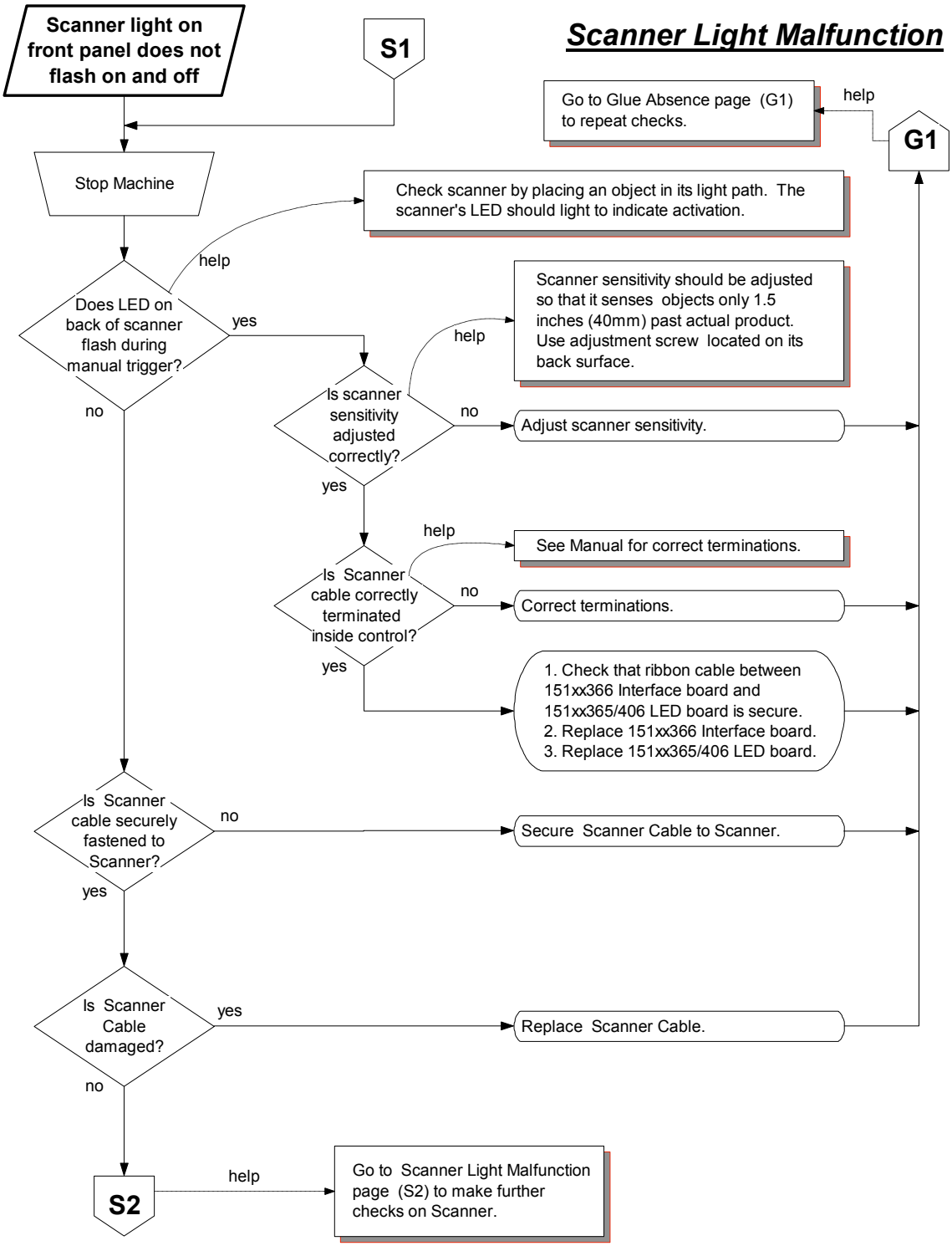
Machine Stop Malfunction



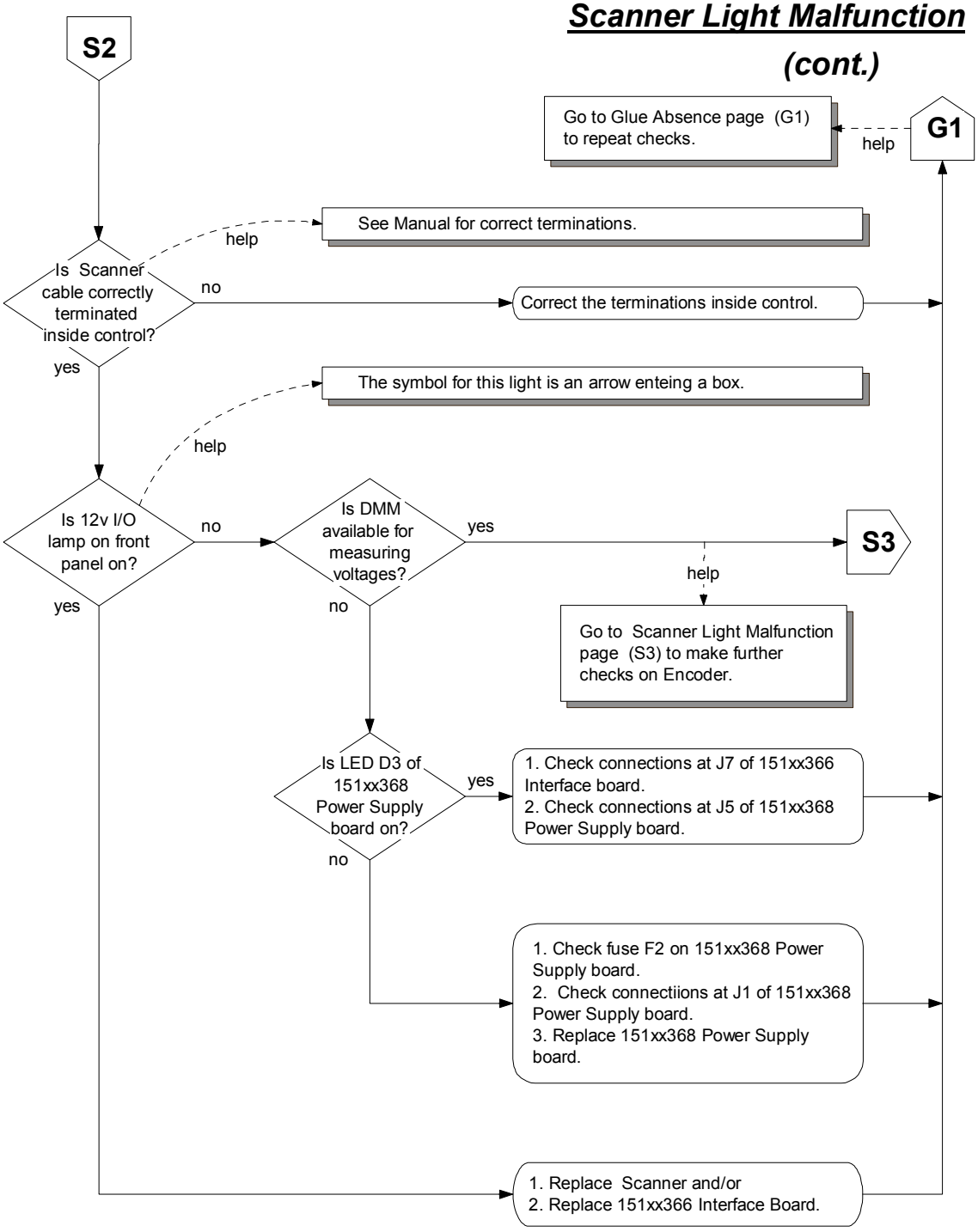
Incorrect Placement of Glue



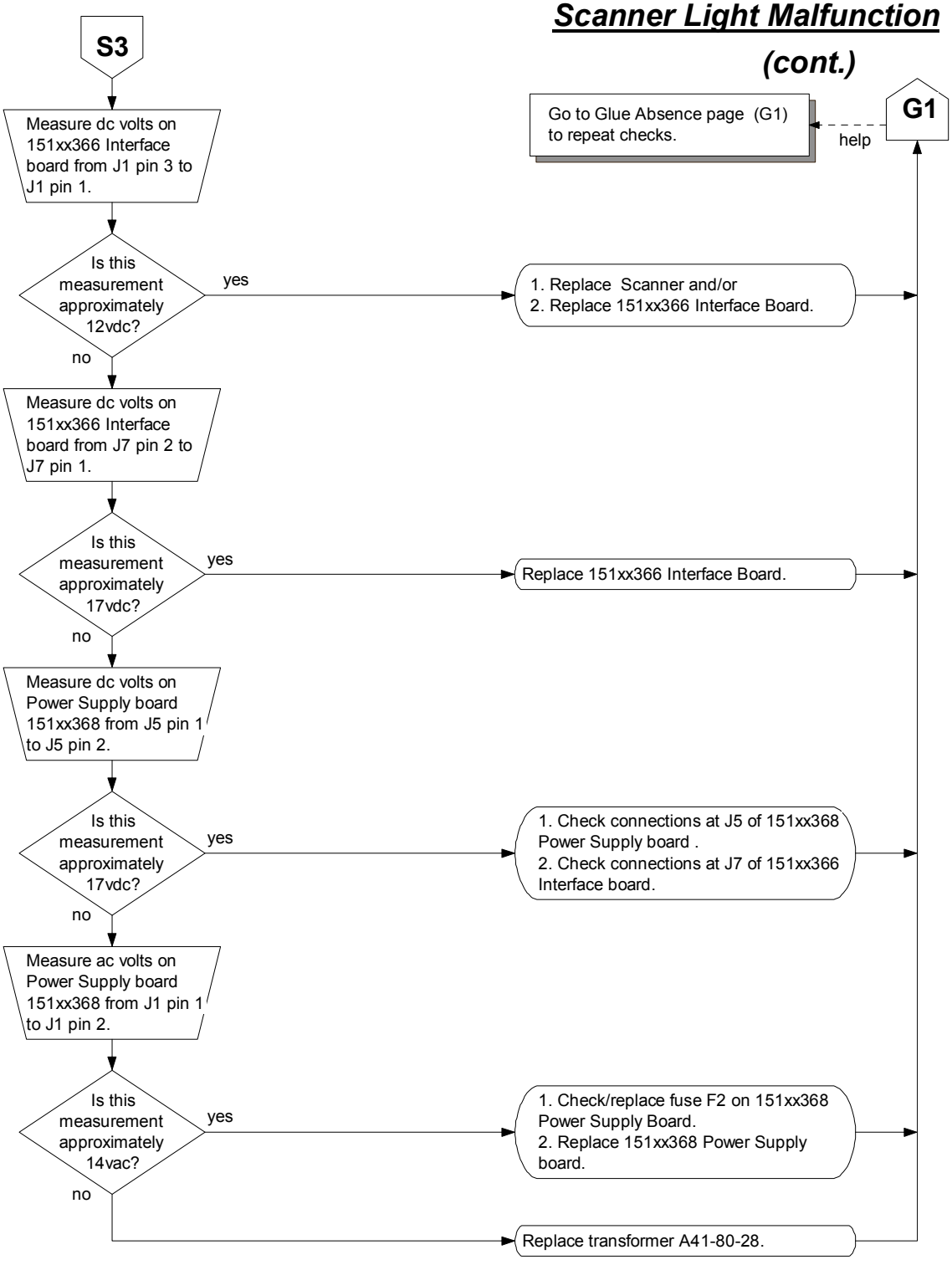
Scanner Light Malfunction



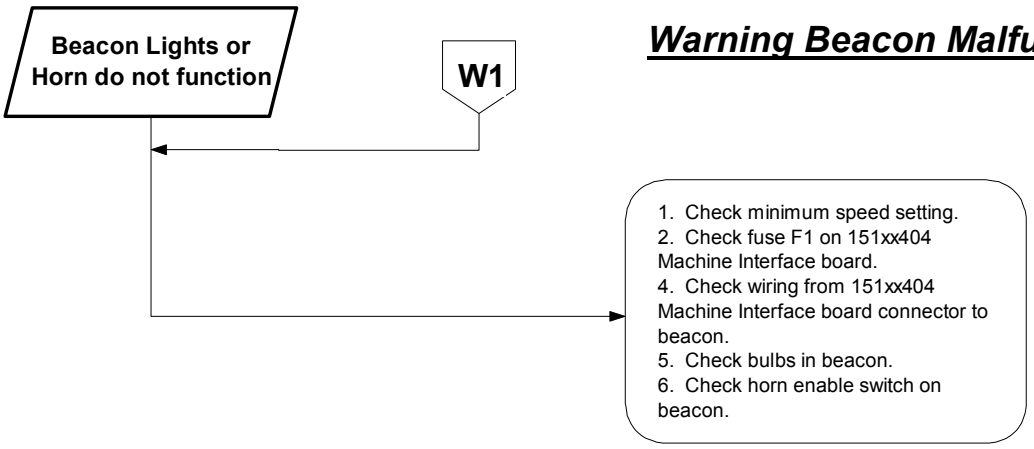
Scanner Light Malfunction (cont.)



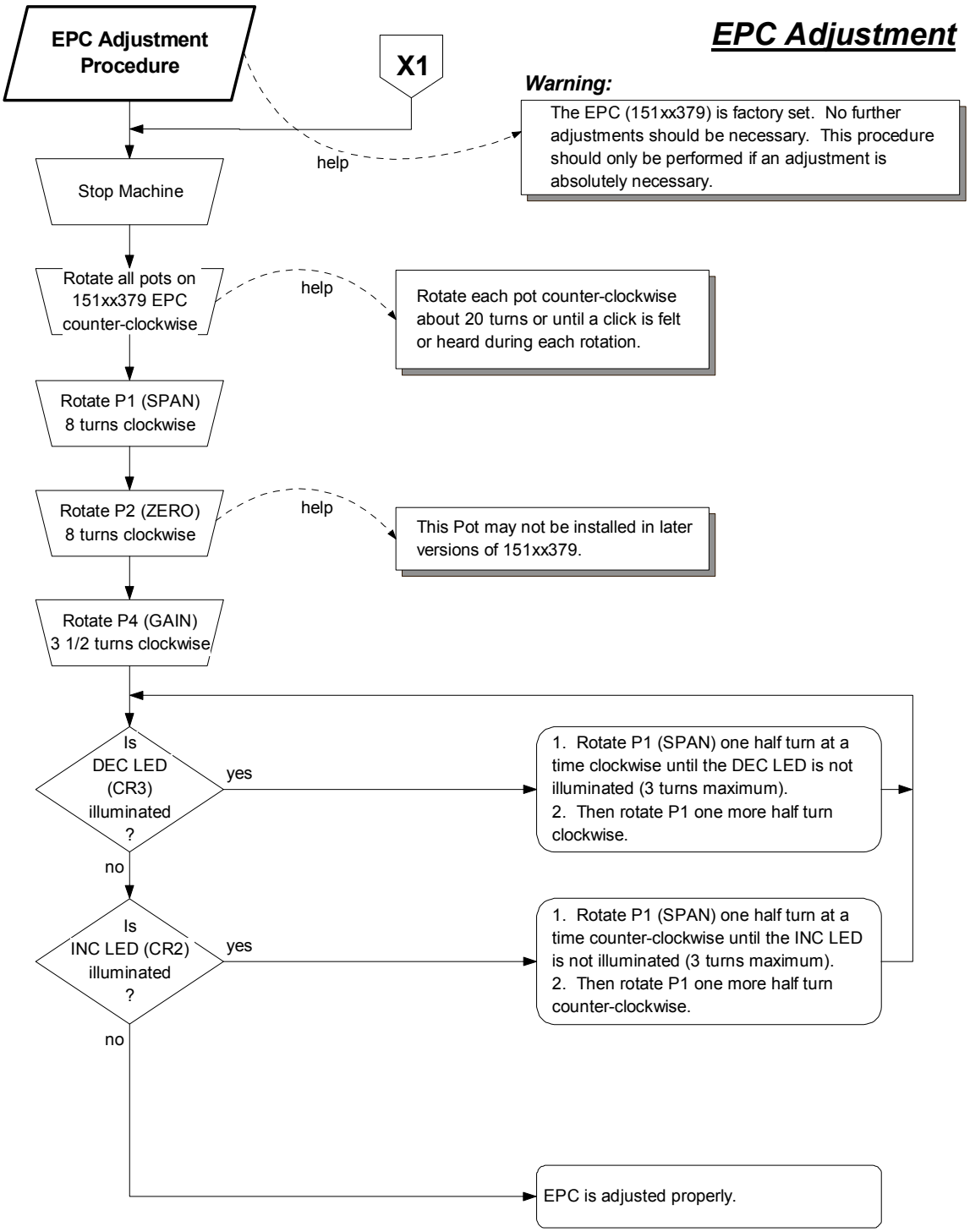
Scanner Light Malfunction (cont.)



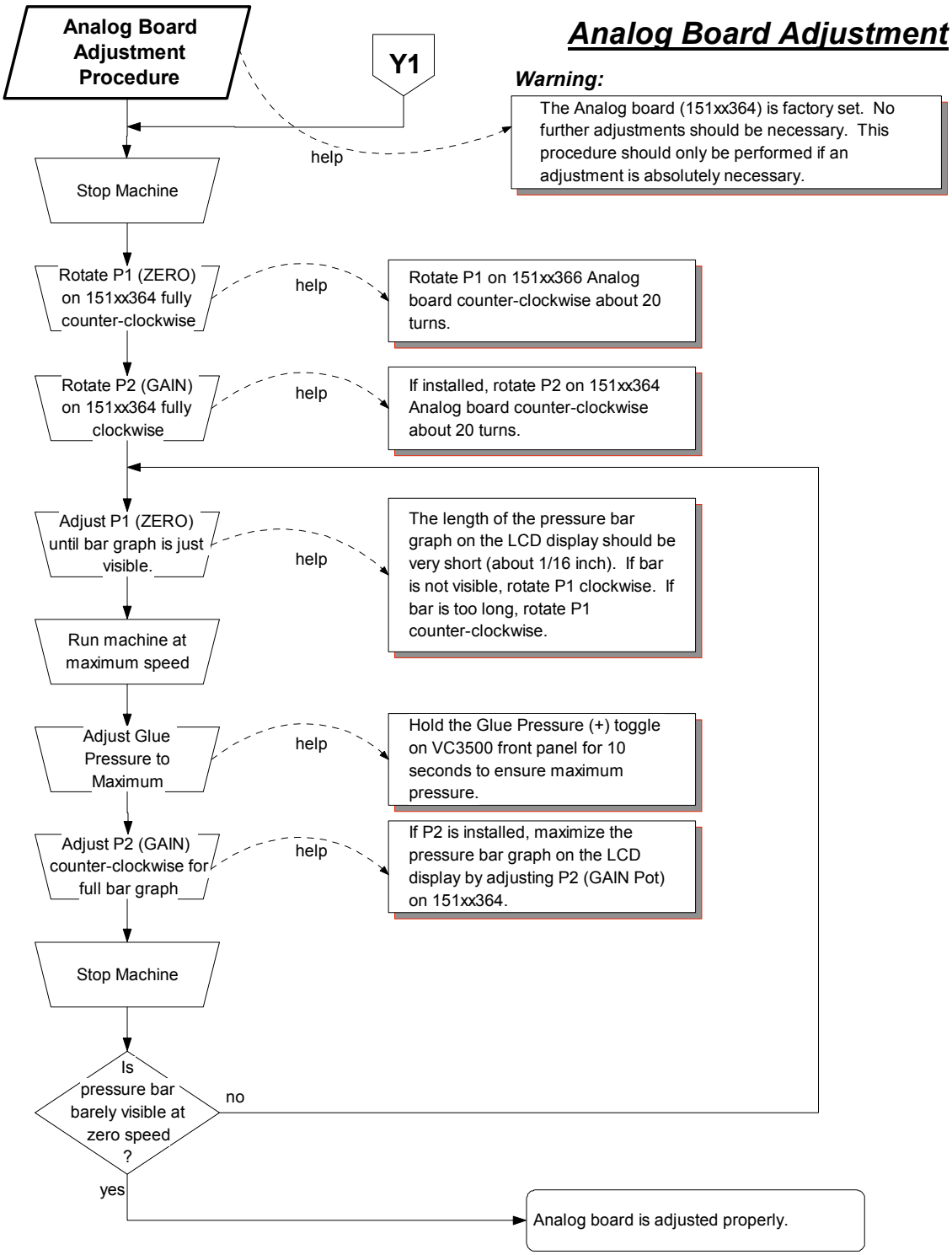
Warning Beacon Malfunction



EPC Adjustment



Analog Board Adjustment



CE Conformance

Testing for CE conformance was performed at Laboratory Test Services, Incorporated in Massachusetts and Valco Cincinnati, Incorporated during the month of December, 1995.