

EPC-12P

Fluid-Flow Control

Manual Number: MC010

Release Date: August 1998

© 1998 Valco Cincinnati, Inc. All Rights Reserved.

This manual is furnished with the EPC-12P fluid-flow control and may only be used or copied in accordance with the terms of purchase.

No part of this manual may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, recording, or otherwise, without the prior written permission of Valco Cincinnati, Inc. The information in this manual is furnished for educational purposes only, is subject to change without notice, and should not be construed as a commitment by Valco Cincinnati, Inc.

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

Part Number: MC010

Printed in the USA

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

Table of Contents

Section 1—Introduction	1-1
About this Manual	1-1
Description of the EPC-12P Fluid-Flow Control	1-1
Capabilities of the EPC-12P Fluid-Flow Control	1-1
System Layout	1-2
Section 2—Safety Information	2-1
General Information	2-1
Warnings	2-1
Cautions	2-2
What to do if Contact with Hot Adhesive Occurs	2-2
What to do if Fire/Exposion Occurs	2-2
What to do if Inhalation of Adhesive Fumes Occurs	2-3
Section 3—General Wiring Guidelines	3-1
Routing Low-Voltage Leads	3-1
Connecting the Supply of Electrical Power	3-1
Section 4—Basic Features	4-1
Introduction	4-1
Front-Panel Features	4-1
Side-Panel Features	4-2
Internal Components	4-3
Regulator Interface	4-4
Section 5—Installation	5-1
Introduction	5-1
Electrical Requirements	5-1
Air Requirements	5-1
Mounting the Control	5-1
Selecting the Encoder	5-1
Customer Connections	5-4
Wiring the Optional Relay	5-6
Wiring the Optional Dump Valve	5-6
Wiring the Optional Web-Detection Scanner	5-6
Wiring the Optional Purge Switch	5-6
Section 6—Initial Setup	6-1
Introduction	6-1
Pneumatic Compound Relief Valve	6-1
Adjusting the Regulator	6-2
Internal Adjustments	6-2
Pulse-Width Adjustment	6-3
Volts Adjustment	6-4
Minimum-Speed Adjustment	6-4
Pressure-Transducer-Zero Adjustment	6-5
Section 7—Operation	7-1
Introduction	7-1
Adjusting Adhesive Flow	7-1
Minimum-Speed Indicator Light	7-1
Fault Light and Alarm	7-2
Startup Procedure	7-2
Glue Pressure at Startup and Shutdown	7-3

Table of Contents, Continued

Section 8—Maintenance	8-1
Introduction	8-1
General	8-1
Manifold Air Valves	8-1
Cabinet	8-2
Removing the Pressure Transducer	8-3
Section 9—Troubleshooting	9-1
Introduction	9-1
EPC-12P Indicator Lights	9-1
Section 10—Specifications	10-1
Introduction	10-1
Section 11—Part-Number List	11-1
Introduction	11-1
Parts List	11-1
Section 12—Warranty	12-1
Warranty Information	12-1
Cold-Glue Equipment and Electronic Controls	12-1
Hot-Melt Units, Hoses, VAvles, and Related Equipment	12-1
Section 13—Service	13-1
Service Needs	13-1
Appendix A—Encoder Selection	A-1
Introduction	A-1
Encoder Selection Chart for Line-Shaft Application (Imperial Measurement)	A-2
Encoder Selection Chart for Line-Shaft Application (Metric Measurement)	A-3
Drive Pulley and Encoder Pulley Combinations	A-4
Encoder Selection Chart for Measuring-Wheel Application	A-5

Section 1—Introduction

About this Manual

Valco Cincinnati has prepared this manual as an aid for installing, operating, and servicing the EPC-12P fluid-flow 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 glue valves. If you need more information, contact your Valco Cincinnati representative.

Description of the EPC-12P Fluid-Flow Control

The EPC-12P monitors pulses received from an optical encoder (the encoder is driven by the parent machine). Pulse speed is converted to voltage.

An air manifold is mounted within the EPC-12P cabinet. Air pressure within the manifold is monitored by a pressure transducer. The circuitry of the EPC-12P compares transducer voltage with encoder-speed voltage. Air is supplied to the manifold if the transducer voltage is lower than the encoder-speed voltage. Air is exhausted from the manifold if the transducer voltage is higher than the encoder-speed voltage. In this manner, manifold pressure is proportional to parent machine speed.

On cold-glue systems, manifold air pressure enters the cap of a standard non-relief fluid regulator through the vent port. The adjusting screw is set for low speed or idle operation. Manifold air pressure from the EPC-12P moves the diaphragm away from the regulator spring in proportion to parent machine speed.

On hot-melt systems, the EPC-12P can be used to control the air pressure to an air-driven adhesive pump, and pneumatic compound relief valves to increase and decrease adhesive pressure related to machine speed.

Capabilities of the EPC-12P Fluid-Flow Control

The EPC-12P control has the following capabilities:

- **Fluid-flow control**—The EPC-12P changes the pressure output of a fluid-pressure regulator in response to the speed changes of a parent machine. The unit controls air-driven cold-glue systems in order to obtain a uniform glue application regardless of parent machine speed.
- **Glue-valve activation**—The EPC-12P is capable of supplying a signal in order to operate a 24-volt, 3-way solenoid. The EPC can also send a signal to another control when more than one valve is being activated (8.5 watts maximum). A minimum-speed adjustment feature disables this valve output below a threshold machine speed.
- **Dump-valve activation (optional)**—The EPC-12P can use a 24VDC, 3-way solenoid to activate a dump valve.
- **Web detection (optional)**—For continuous gluing applications, an LED scanner can be added to monitor the web. If the web breaks, the glue application will stop.

Section 2—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 WARNING 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 WARNING MAY RESULT IN DEATH, PERSONAL INJURY, AND/OR EQUIPMENT DAMAGE.**



CAUTION! This convention is used to alert the user to important installation, operation, and/or maintenance information. **FAILURE TO OBSERVE CAUTION MAY CAUSE EQUIPMENT DAMAGE.**

Warnings

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



WARNING! Disconnect all power before opening the control. **OTHERWISE, DEATH OR PERSONAL INJURY COULD OCCUR.** Only qualified personnel should open and service the control.



WARNING! Promptly repair or replace all worn or damaged electrical wiring and equipment wires. **OTHERWISE, DEATH OR PERSONAL INJURY COULD OCCUR.**



WARNING! Properly route all electrical wires. **OTHERWISE, DEATH, PERSONAL INJURY, OR DAMAGE TO THE MOVING PARTS OF THE MACHINE MAY OCCUR.**



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. OTHERWISE, DEATH OR PERSONAL INJURY COULD OCCUR.



WARNING! Keep pump cover and electrical enclosures closed except during setup, service, and checkout procedures. OTHERWISE, DEATH OR PERSONAL INJURY COULD OCCUR.



WARNING! Promptly repair or replace all worn or damaged parts. OTHERWISE, PERSONAL INJURY OR EQUIPMENT DAMAGE COULD OCCUR.



WARNING! Always wear insulated gloves and proper eye protection when working around hot-melt equipment. A protective screen around the face is also recommended. OTHERWISE, DEATH OR PERSONAL INJURY COULD OCCUR.



WARNING! Purge the fluid pressure from the system before disconnecting any part of the system. OTHERWISE, DEATH OR PERSONAL INJURY COULD OCCUR.



WARNING! People with respiratory problems (e.g., asthma, bronchitis, etc.) should not work in the vicinity of molten adhesive. RESPIRATORY PROBLEMS MAY BE AGGRAVATED BY THE FUMES. Do not wear a face mask when working around molten adhesive. THE MASK MAY TRAP THE FUMES AND DEATH OR PERSONAL INJURY COULD OCCUR.



WARNING! Keep hot-melt hoses away from walkways and the moving parts of hot-melt systems. OTHERWISE, PERSONAL INJURY OR EQUIPMENT DAMAGE COULD OCCUR.



WARNING! The hot-melt unit should be installed so that it can be turned off at a location away from the hot-melt unit. OTHERWISE, DEATH, PERSONAL INJURY, OR EQUIPMENT DAMAGE COULD OCCUR.

Cautions

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



CAUTION! Never hose or steam-clean the unit. If the surrounding area is cleaned in this manner, protect the unit by covering it with plastic or other waterproof material. OTHERWISE, DAMAGE TO EQUIPMENT COULD OCCUR.



CAUTION! Do not bend hot-melt hoses less than an 18-inch (460 mm) radius. OTHERWISE, EQUIPMENT DAMAGE COULD OCCUR.



CAUTION! Place Material Safety Data Sheets for the adhesive near the unit. OTHERWISE, DAMAGE TO EQUIPMENT COULD OCCUR.

What to Do if Contact with Hot Adhesive Occurs



WARNING! The heat that is contained in hot-melt material will continue to penetrate and deeply burn the skin unless rapidly cooled by external means such as water. Do not attempt to remove set hot-melt adhesive from the skin. OTHERWISE, PERSONAL INJURY COULD OCCUR.

If hot adhesive comes in contact with the skin, do the following:

1. Immediately immerse the contacted area in clean, cold water.

Note! It is recommended that a source of clean, cold water be provided near the hot-melt work area.

2. Cover the affected area with a clean, wet compress and see a physician immediately.

What to Do if Adhesive-Related Fire or Explosion Occurs

During the heating and melting process, the surface of the adhesive will be exposed to air. The mixture of polymer fumes and air can catch fire if the hot-melt is overheated.



WARNING! Poor ventilation, smoking, and open flames can cause overheated hot-melt to ignite. Adequate ventilation must be provided. Smoking should be prohibited in the immediate vicinity of the molten adhesive. Open flames must be kept away from the area around molten adhesive. OTHERWISE, DEATH, PERSONAL INJURY, OR DAMAGE TO EQUIPMENT COULD OCCUR.



WARNING! Exposed arcing may ignite the fume/air mixture. Shield all electrical equipment from melt fumes to avoid exposed arcing. OTHERWISE, PERSONAL INJURY OR EQUIPMENT DAMAGE COULD OCCUR.



WARNING! Do not use a water extinguisher to extinguish the fire! OTHERWISE, PERSONAL INJURY OR EQUIPMENT DAMAGE COULD OCCUR.

If the hot-melt adhesive ignites, promptly perform the following steps:

1. Sound a fire alarm.
2. Evacuate the immediate area.
3. Turn off all local electrical equipment at the source.
4. Fight the fire in *one* of the following ways:
 - Smother the fire with a fire blanket.
 - Aim a CO₂ fire extinguisher at the base of the flames.
 - Aim a dry-powder fire extinguisher at the base of the flames.

What to Do if Inhalation of Adhesive Fumes Occurs

If Adhesive fumes are inhaled, immediately follow these steps:

1. Take the victim away from the immediate work area.
2. Provide victim with fresh air.
3. Call a qualified medical authority.

Section 3—General Wiring Guidelines

Routing Low-Voltage Leads



WARNING! Electrical installation should be made only by experienced service personnel! OTHERWISE, DEATH, PERSONAL INJURY, OR EQUIPMENT DAMAGE COULD OCCUR.

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



WARNING! Electrical connections should be made only by experienced service personnel! OTHERWISE, DEATH, PERSONAL INJURY, OR EQUIPMENT DAMAGE COULD OCCUR.

When connecting the supply of electrical power, follow these guidelines:

- Connect the control to a “clean” supply of electrical power. Use a dedicated circuit if possible.

Note! 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. Otherwise, equipment may not function properly.

Section 4—Basic Features

Introduction

This section describes the basic features of the EPC-12 fluid-flow control.

Front-Panel Features

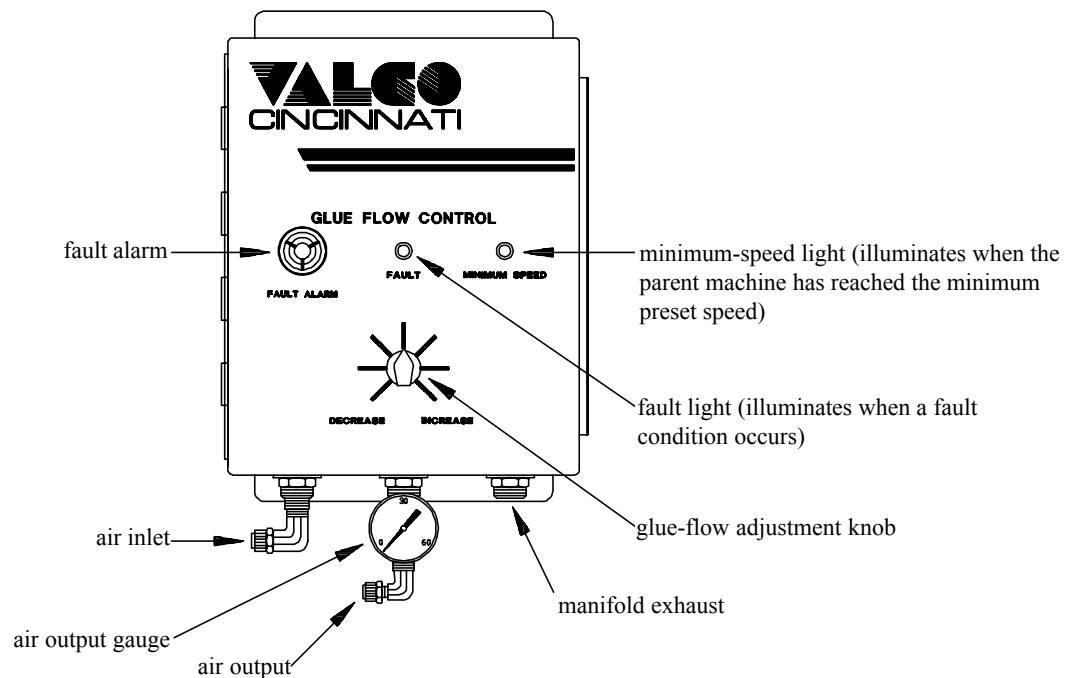


Figure 4-1. Front-Panel Features

Side-Panel Features

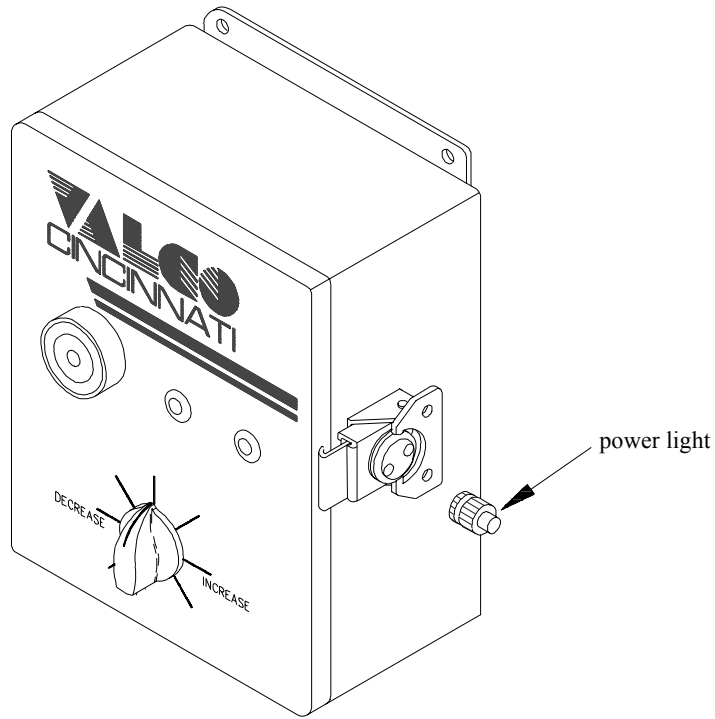


Figure 4-2. Side-Panel Features

Internal Components

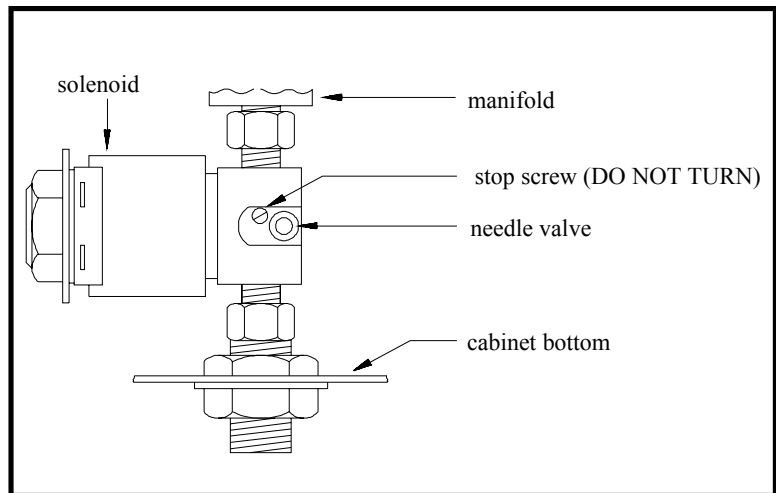
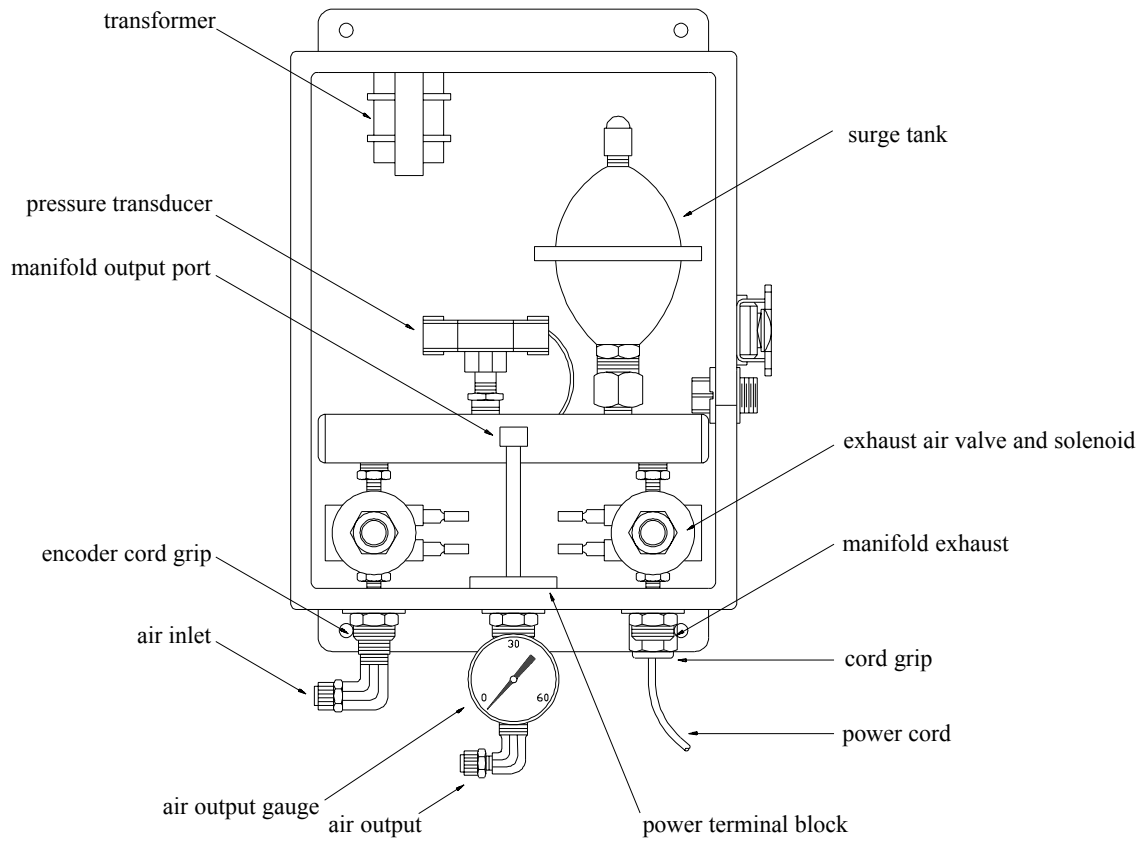


Figure 4-3. Internal Components

Regulator Interface

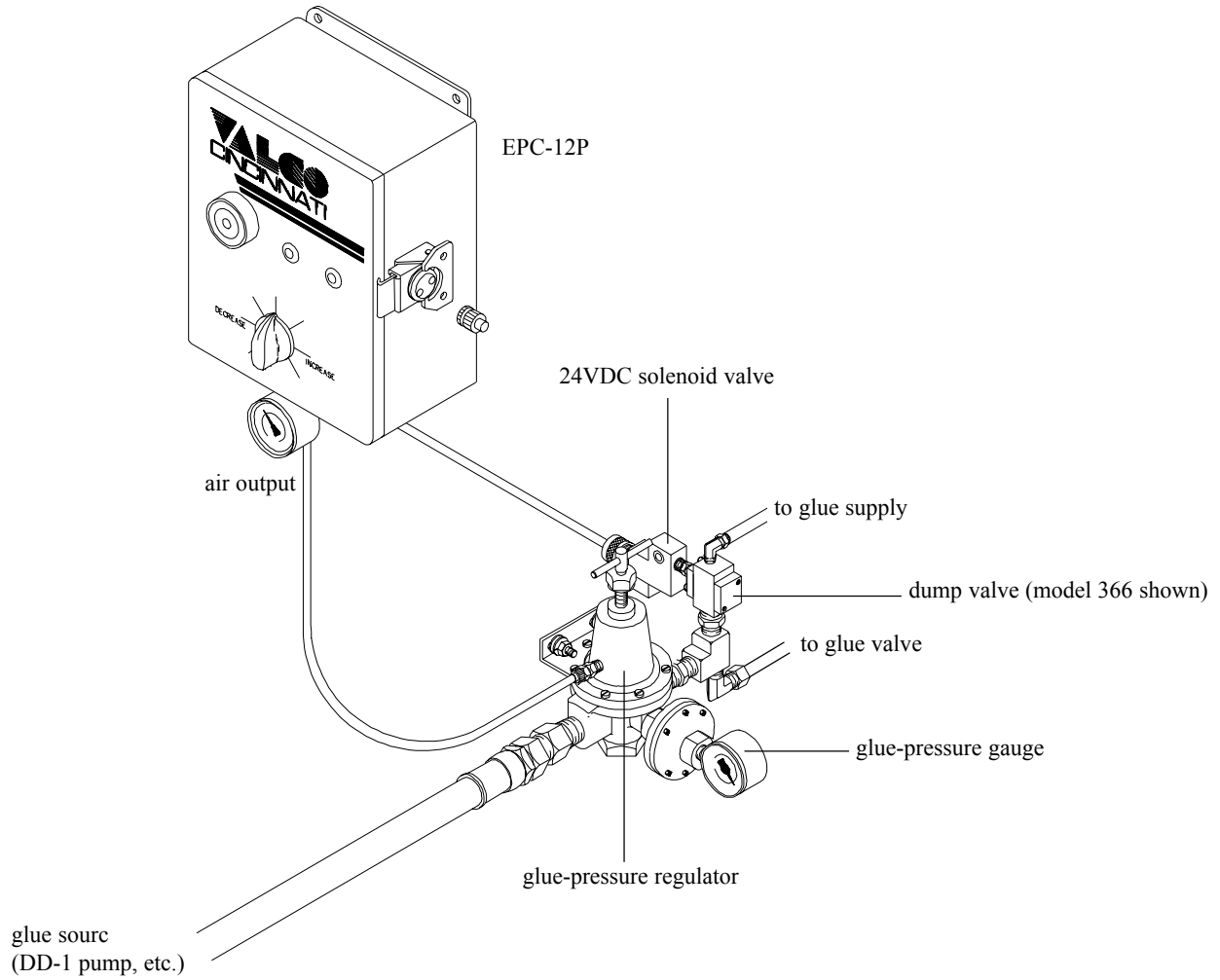


Figure 4-4. Regulator Interface

Encoder Assemblies

There are two types of encoder assemblies:

- Measuring-wheel encoder assembly
- Line-shaft encoder assembly

Note! See “Appendix A” for encoder selection guide.

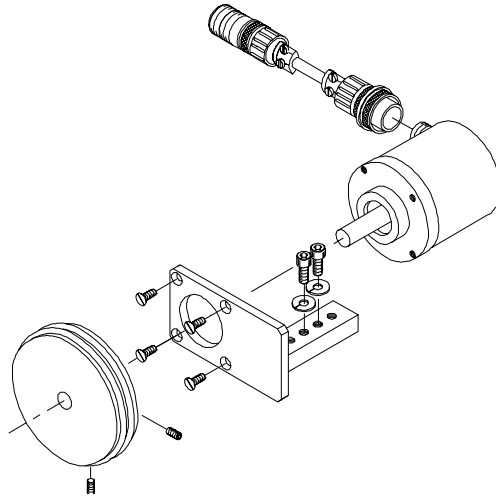


Figure 4-5. Measuring-Wheel Encoder Assembly

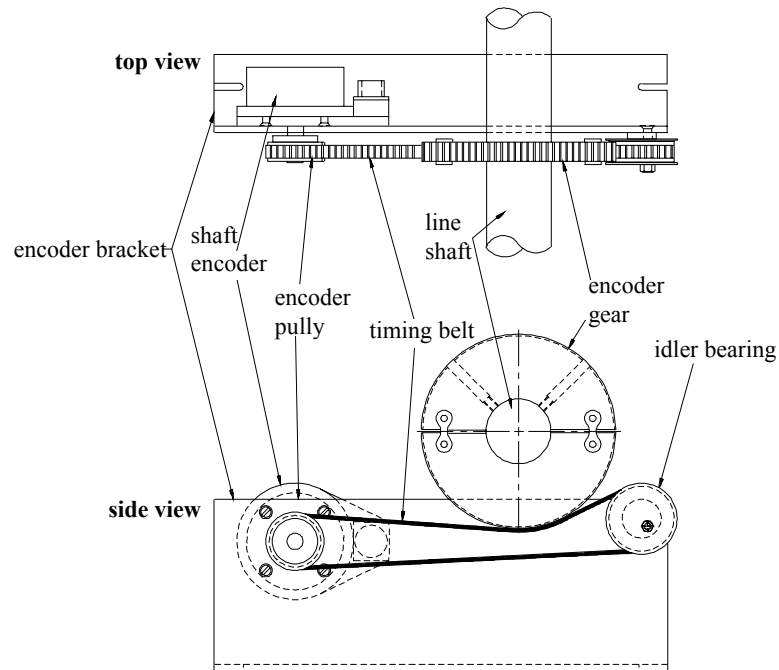


Figure 4-6. Line-Shaft Encoder Assembly

Section 5—Installation

Introduction

This section contains installation information for the EPC-12P control.

Electrical Requirements

The EPC-12P requires 115/230VAC, 50/60 Hz., one ampere maximum, single-phase power supply with ground.

Air Requirements

80-120 psi (5.5-8.3 bar)

Mounting the Control

Mount the EPC-12P unit at or near the operator's station. The unit is supplied with 25 ft. (8 m) of 3/8" O.D. inlet tubing and 25 ft. (8 m) of 1/4" O.D. output tubing.

See "Specifications" page for mounting hole measurements.

Selecting the Encoder

The encoder can be driven with either a *measuring wheel* or a *line-shaft assembly*. The measuring wheel can be used over the entire speed range of the parent machine. There are low-speed limitations associated with the line-shaft assembly method.

It is necessary to use the appropriate encoder for the drive method being used. In order to determine the appropriate encoder, see *Appendix A—Encoder Selection*.

Electrical Installation of the Control



WARNING! Electrical installation should be accomplished only by experienced service personnel! OTHERWISE, DEATH OR PERSONAL INJURY COULD OCCUR.



WARNING! Ensure that the correct operation voltage is selected (see “Connecting the Main Power Supply” below) before turning the unit on. OTHERWISE, DEATH OR PERSONAL INJURY COULD OCCUR.



WARNING! Turn off the power and unplug the unit before switching the power voltage or making any rear-panel connections. OTHERWISE, DEATH OR PERSONAL INJURY COULD OCCUR.

The main power supply must be either 115/230 VAC, 50/60 Hz or 100/200 VAC, 50/60 Hz. The 115/230VAC power requirement is field-selectable. The power-entry module accepts a standard IEC power cord, which is supplied.

Connecting the Main Power Supply

To connect the main power supply to the control, follow these steps:

1. *Select the voltage:*

- 1a. Turn off the power switch on the power-entry module (Figure 5-1).
- 1b. If the power cord is attached to the power-entry module, remove the power cord.
- 1c. Using a small screwdriver, open the hinged door of the fuse holder.

Note! The fuse holder on the power-entry module contains the fuse drawer (Figure 5-2), which allows for either 115 or 230 VAC operation.

- 1d. Remove the fuse drawer, ensuring that the fuse(s) in the holder remain in place.
- 1e. *If the control will be connected to 115VAC*, rotate the drawer so that 115V will show through the door opening. *If the control will be connected to 230VAC*, rotate the drawer to the 230V position.



CAUTION! The control uses a 1A, 250V, SLO-BLO standard fuse for 115V operation and a 1A, 250V, SLO-BLO standard fuse for 230V operation. No other type of fuse should be used. OTHERWISE, DAMAGE TO EQUIPMENT COULD OCCUR.



WARNING! The setup in step 1f may vary, depending on what country the system is being installed in. 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. OTHERWISE, DEATH, PERSONAL INJURY, OR DAMAGE TO EQUIPMENT COULD OCCUR.

- 1f. *For line-to-neutral operation*, use either the shorting clip and one fuse or use two fuses. (The shorting clip will be on the left side of the drawer when rotated to the correct voltage position as shown in Figure 5-1.) *For line-to-line use*, discard the shorting clip and use two fuses.
- 1g. Replace the drawer in the fuseholder in the correct voltage position and close the door of fuseholder.
- 1h. Ensure that the correct operating voltage shows through the window in the fuse drawer.

2. Connect the power cord:

- 2a. Insert the power cord into the power-entry module.
- 2b. Attach the power-cord clamp (if provided), using the two screws on either side of the power-entry module.

Note! Not all controls have a power-cord clamp.

- 2c. Tighten the power-cord clamp to prevent the cord from working its way out of the module and to provide strain relief for the line cord.

Note! The supplied power cord can either be directly wired to a branch circuit or, with the proper plug type, plugged into an outlet. The wire colors of the supplied power cord are as follows:

Wire Function	International Power-Cord Color	North-American Power-Cord Color
Line Voltage	Brown	Black
Neutral	Blue	White
Protective Earth	Green/Yellow	Green

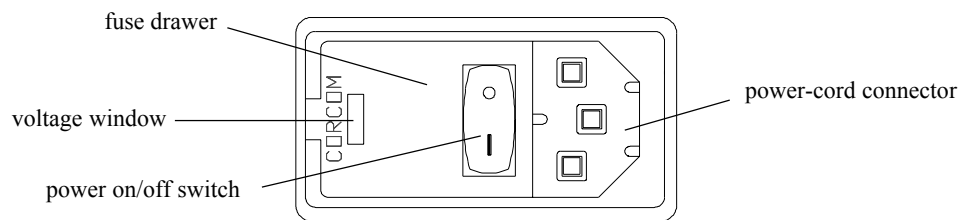


Figure 5-1. Power-Entry Module

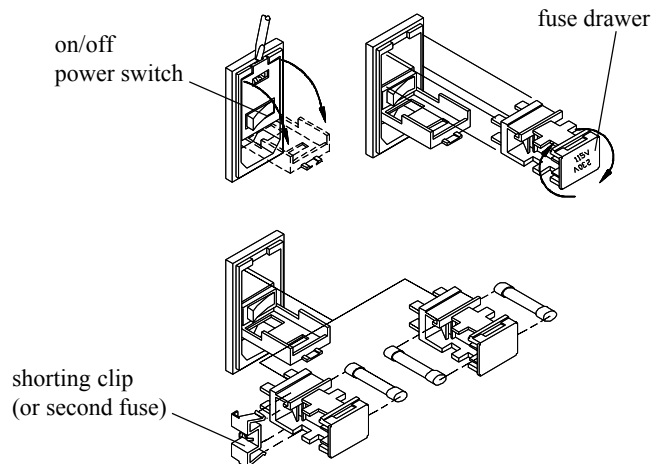


Figure 5-2. 115V/230V Fuse Drawer

Customer Connections

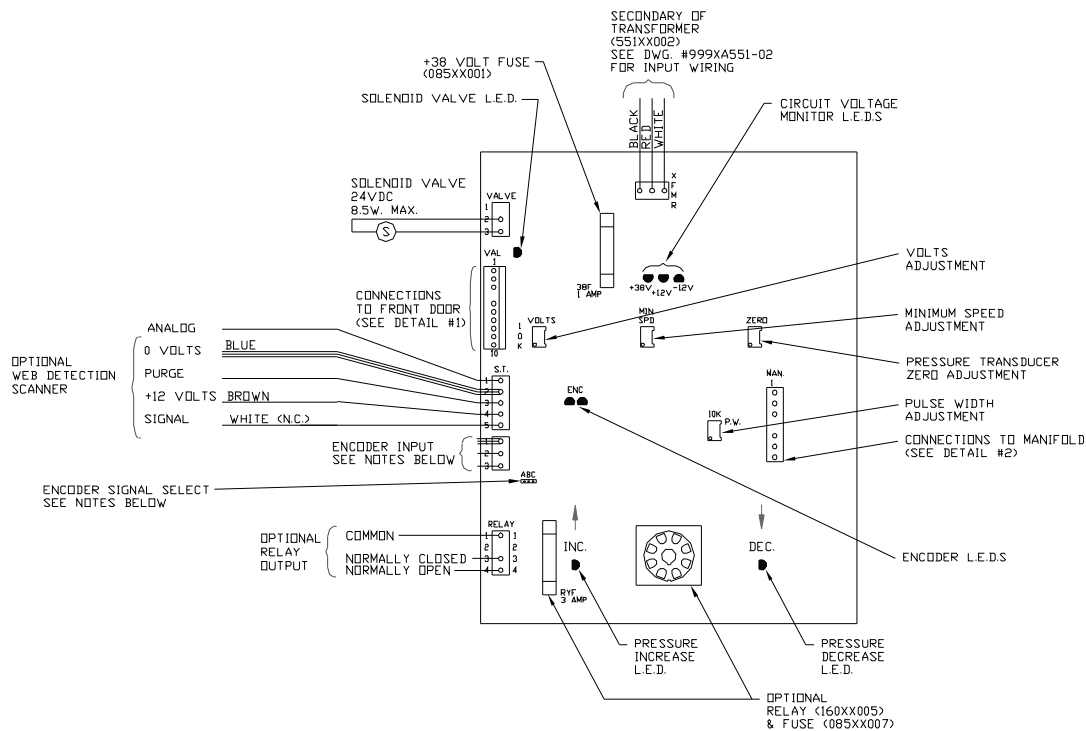
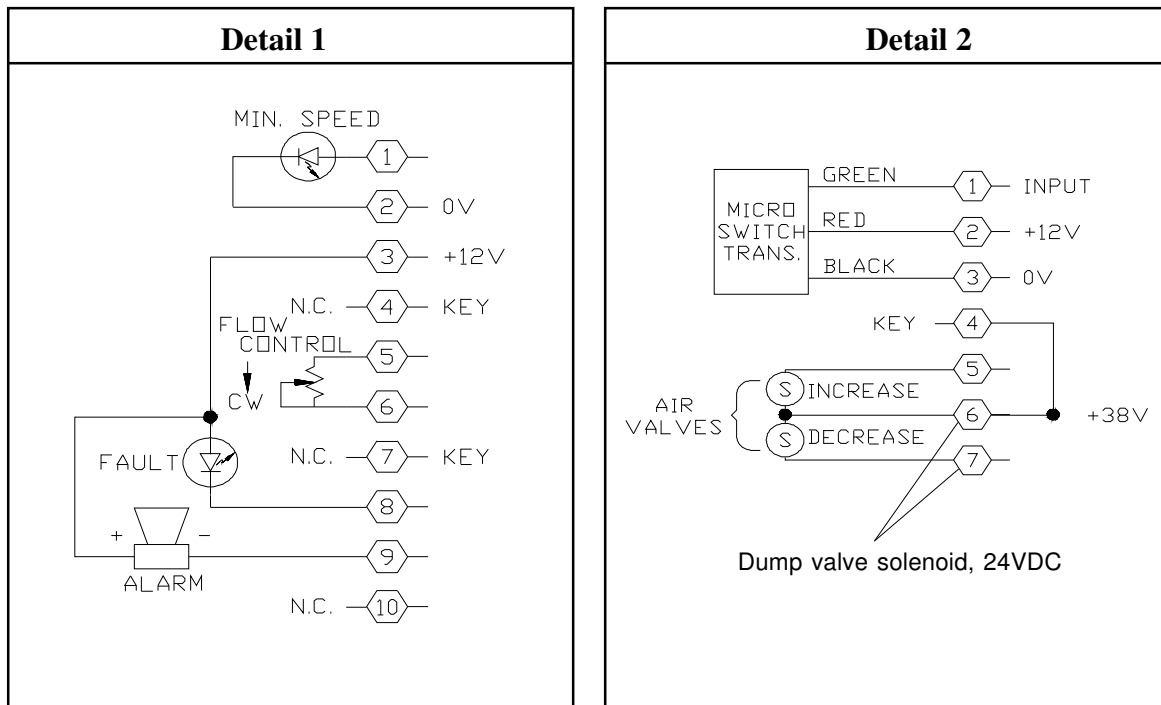
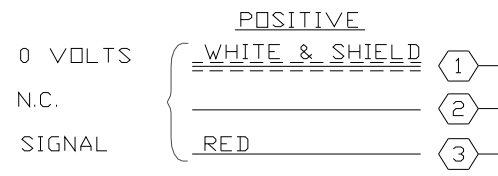


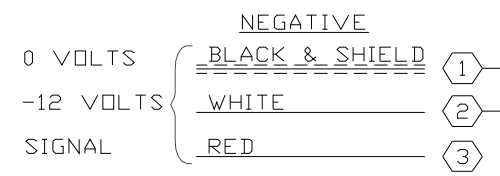
Figure 5-3. Customer Connections



**Encoder Input Detail
VCE Encoders**



A/B = POSITIVE (ENCODER SIGNAL FROM VC-450, VC-450EC OR VC-850 CONTROL).

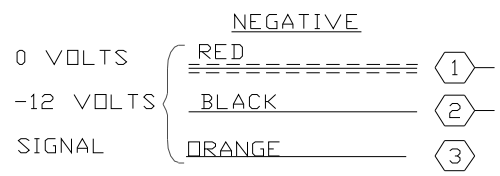


B/C = NEGATIVE (ENCODER ONLY).

**Encoder Input Detail
VDD Encoders**



A/B = POSITIVE (ENCODER SIGNAL FROM VC-450, VC-450EC OR VC-850 CONTROL).



B/C = NEGATIVE (ENCODER ONLY).

Figure 5-4. Customer Connections

Wiring the Optional Relay

See Figure 5-3.

Wiring the Optional Dump Valve

To wire the optional dump valve (Figure 5-4, Detail 2), follow these steps:

1. Remove the manifold-terminal block plug from the circuit board.
2. Back out the locking screws for wires 6 (red) and 7 (white).

Note! Each receptacle in the plug will take two wires.

3. Insert the dump valve wires
4. Tighten the locking screws.
5. Replace manifold-terminal block plug.

Note! A 24VDC, 3-way solenoid must be used to activate the dump valve.

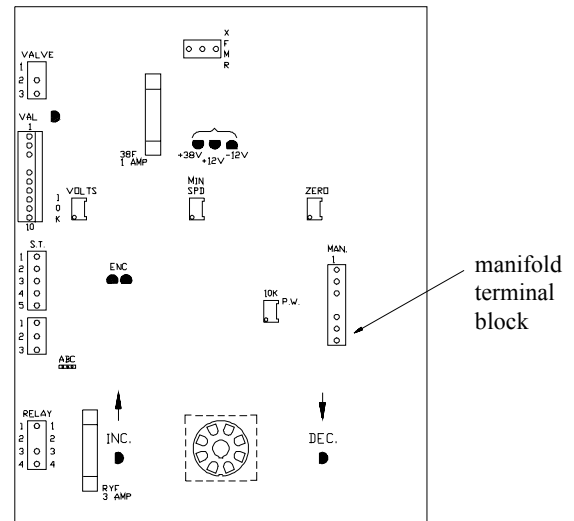


Figure 5-5.

Wiring The Optional Web-Detection Scanner

For continuous-gluing applications, an LED scanner can be added to monitor the web. If the web breaks, the glue application will stop. See Figure 5-? for details.

Wiring The Optional Purge Switch

To wire the the optional purge switch, follow these steps:

1. Attach the black wire and shield wire to pin #2 “0” volts, on the 5-pin S.T. (speed tracking connector).
2. Attach the yellow wire to pin 3, S.T. terminal.

Section 6—Initial Setup

Introduction

This section contains initial setup procedures for the EPC-12P control.

Pneumatic Compound Relief Valve

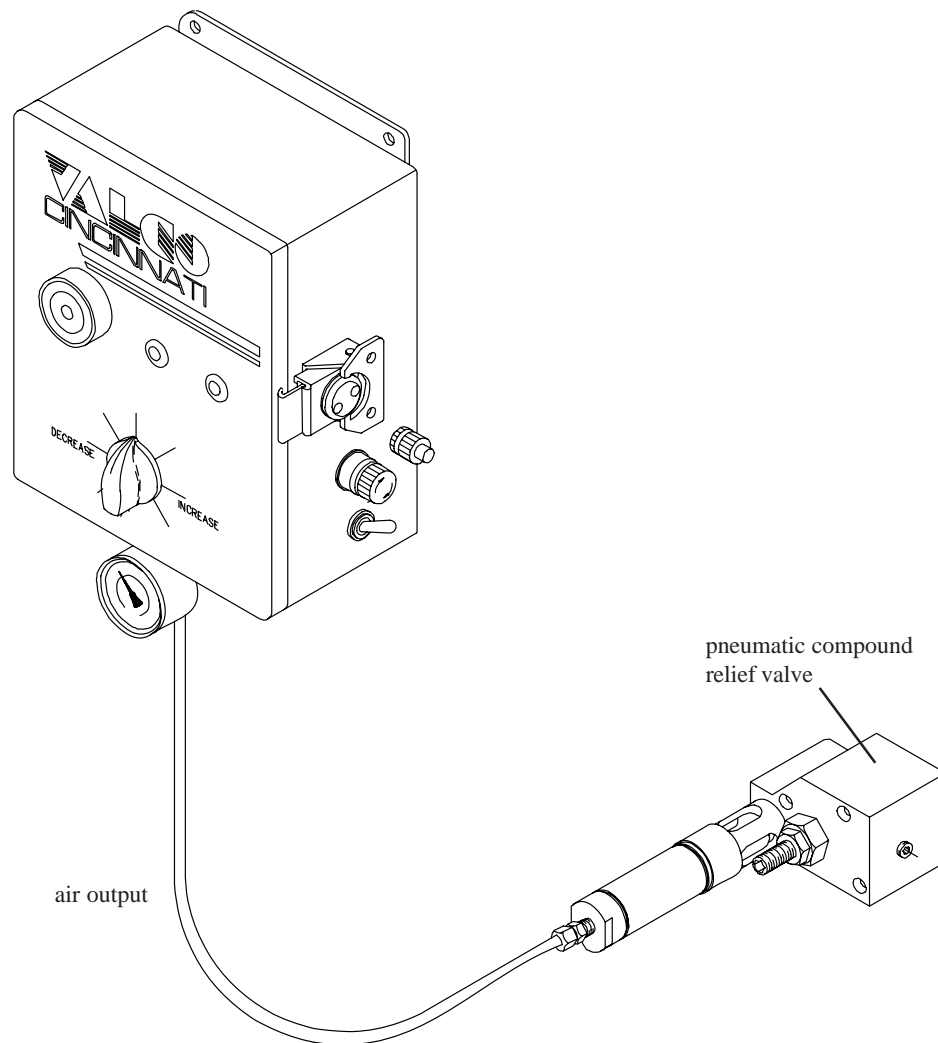


Figure 6-1. EPC-12P Control

Adjusting the Regulator

To adjust the regulator (Figure 6-5), follow these steps:

1. Disconnect the air output line from the EPC-12P.
2. Turn the sealing nut on the regulator counterclockwise until it reaches the top of the threaded shank.
3. Run the parent machine at the lowest desired operating speed.
4. Turn the regulator's "T" handle to obtain the desired adhesive flow.
5. Hold the "T" handle in place while turning the sealing nut clockwise until the sealing nut stops.

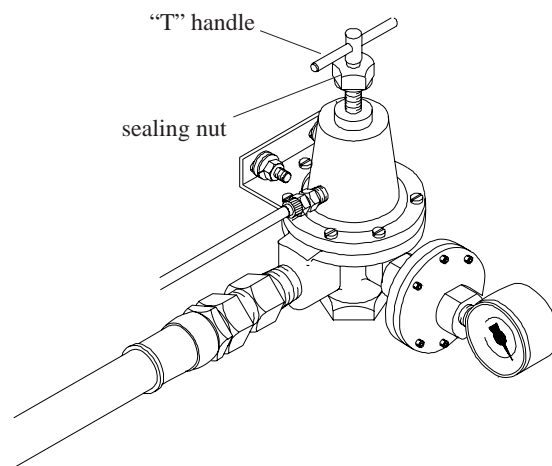


Figure 6-5. Regulator

Internal Adjustments



CAUTION! The glue-control knob on the front panel must be set to the 12 o'clock position before making adjustments.

The following adjustments can be made on the circuit board located inside the EPC-12P cabinet:

- Pulse-width adjustment
- Volts adjustment
- Minimum speed adjustment
- Pressure transducer zero adjustment

Note! Internal adjustments are made by using a screwdriver to turn thirty-turn clutched potentiometers on the circuit board. A click can be heard when the adjustment has been turned completely left or right.

Pulse-Width Adjustment

The pulse-width adjustment changes the duration of the pulse that has been received from the encoder in order to produce a strong output signal. It is a course adjustment that changes the maximum adhesive flow to correspond with the maximum machine speed (or the machine speed at which adhesive flow is desired to be maximum).

To adjust the pulse-width adjustment, follow these steps:

1. Set the glue-flow control knob to the 12 o'clock (vertical) position.
2. Turn the volts adjustment (Figure 6-7) completely to the left or right until you hear a click.
3. Turn the volts adjustment 15 positions in the opposite direction.

Note! The adjustment is now in the center position.

4. Turn the pulse-width adjustment fully counterclockwise until you hear a click. This sets the circuit for high parent-machine speed. (This is equal to moving line “A” in Figure 6-6 as far to the right as possible.)
5. Run the parent machine at maximum speed (or the speed at which adhesive flow is desired to be maximum).
6. Turn the pulse-width adjustment clockwise until the adhesive flow appears to be maximum.

Note! This is a course adjustment. It is not necessary to be precise.

Adjustment of the pulse width is equivalent to shifting line “A” to the right or the left in the Figure 6-6.

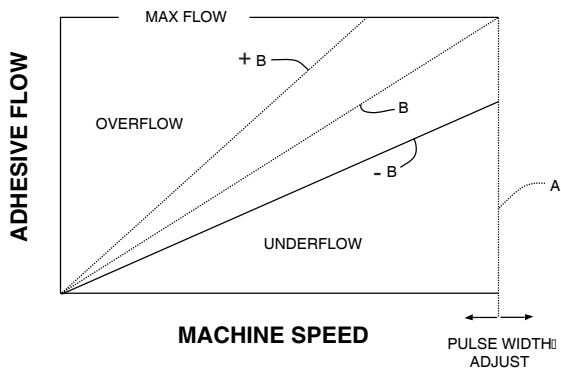


Figure 6-6.

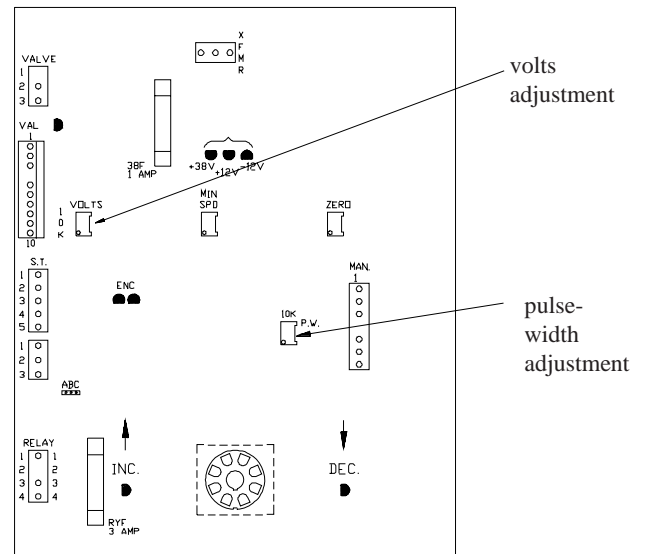


Figure 6-7. Pulse-Width Adjustment

Volts Adjustment

The volts adjustment is used to synchronize the maximum adhesive flow with the maximum speed of the machine (shown as line “B” in Figure 6-8). If the adhesive flow reaches maximum before the parent machine reaches its top speed, then adhesive application will not increase with further increases of machine speed (shown as line “+B”). If the parent machine reaches its top speed before the adhesive flow reaches maximum, then the adhesive flow is limited over the entire speed range of the parent machine (shown as line “-B”).

To adjust the volts adjustment, follow these steps:

1. Set the glue-flow control knob to the 12 o'clock (vertical) position.
2. Turn the volts adjustment clockwise to increase the adhesive flow. Turn the volts adjustment counterclockwise to decrease the adhesive flow.

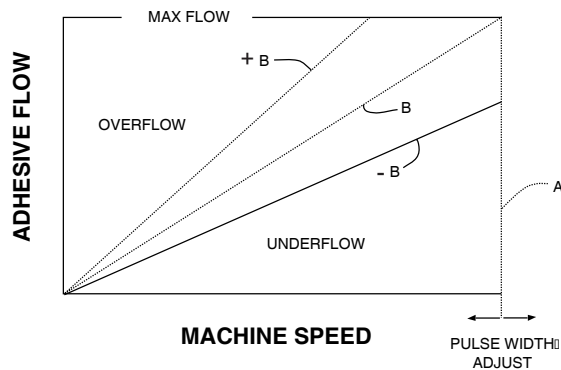


Figure 6-8.

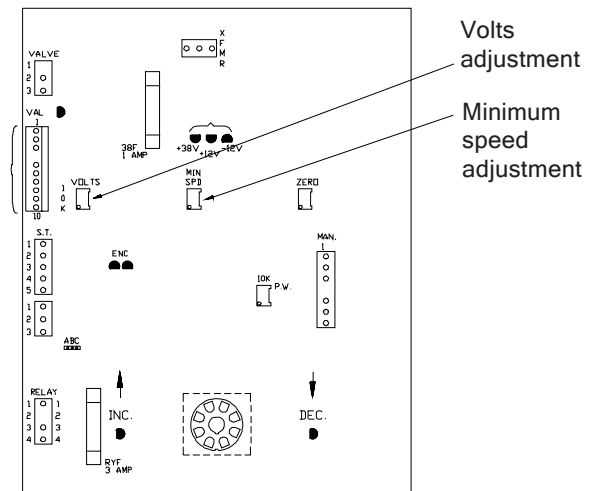


Figure 6-9. Volts Adjustment

Minimum-Speed Adjustment

The minimum-speed adjustment raises and lowers the threshold speed at which the minimum speed safety circuit is activated. A clockwise rotation increases the threshold speed, and a counterclockwise rotation will decrease the threshold speed. The minimum-speed light on the front of the EPC-12P illuminates when the minimum-speed circuit is on.

Pressure-Transducer-Zero Adjustment

The pressure-transducer-zero adjustment is used to synchronize a particular transducer to a particular system. The EPC-12P is sent with this adjustment at zero. If the transducer is replaced outside of the factory, use the following procedure:

1. Turn the parent machine off.
2. Disconnect the air inlet line so that the manifold cannot receive air.
3. Turn the EPC-12P on.
4. Wait two minutes until the amplifier in the pressure transducer stabilizes.
5. If the pressure-increase LED is illuminated, turn the pressure-transducer-zero adjustment clockwise until the LED goes off. Continue to turn the adjustment clockwise until the pressure-decrease LED illuminates. Turn the adjustment counterclockwise to the middle position (about one half of a turn).
6. If the pressure-decrease LED is illuminated, turn the pressure-transducer-zero adjustment counterclockwise until the LED goes off. Continue to turn the adjustment counterclockwise until the pressure-increase LED illuminates. Turn the adjustment clockwise to the middle position (about one half of a turn).

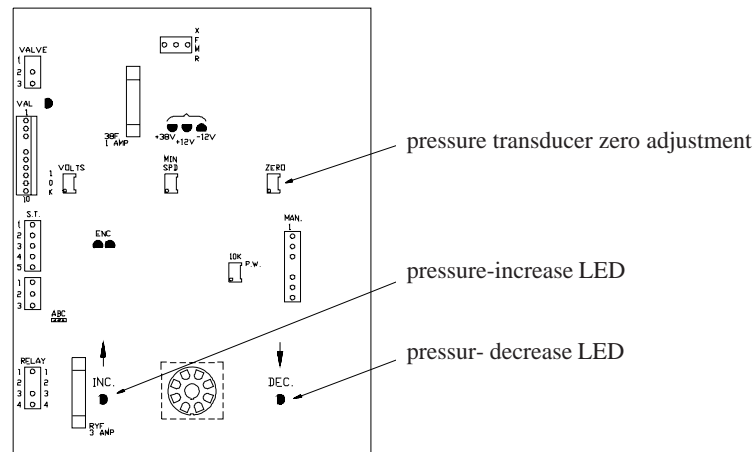


Figure 6-10. Pressure-Transducer-Zero Adjustment

Section 7—Operation

Introduction

This section contains operation procedures for the EPC-12P control.

Adjusting Adhesive Flow

To adjust adhesive flow, follow these steps:

1. Turn the glue-flow control knob clockwise to increase the adhesive flow. Turn the glue-flow control knob counterclockwise to decrease the adhesive flow.
2. If glue flow is not sufficient, see *Section 6—Initial Setup*.

Minimum-Speed Indicator Light

The minimum-speed indicator light illuminates when the parent machine has reached a preset minimum speed. (See *Section 6—Initial Setup* for the minimum-speed adjustment procedure).

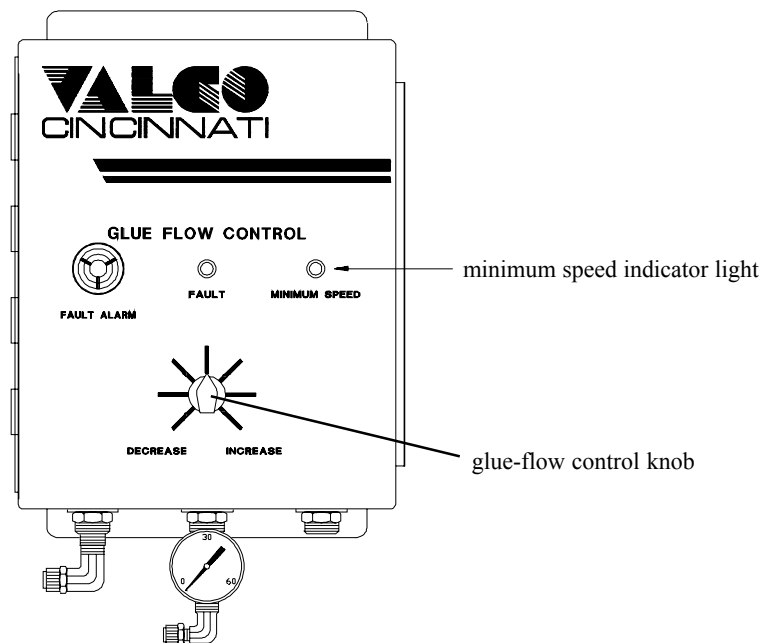


Figure 7-1. EPC-12P Control

Fault Light and Alarm

The front panel fault light will illuminate if the EPC-12P is not registering air pressure. The fault alarm will sound after 30 seconds.

If the fault light illuminates:

- Check the air output gauge of the air regulator.
- If the air regulator gauge is registering the correct air output pressure, the air line from the air regulator to the EPC may be obstructed. Check the needle valve inside the cabinet of the EPC.

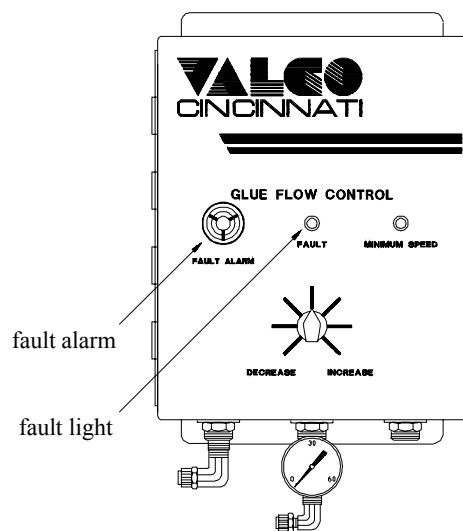


Figure 7-2. EPC-12P Control

Startup Procedure

To start up the EPC-12P control, follow these steps:

1. Prepare the parent machine for operation.
2. Turn on the shop air supply.
3. Turn on the EPC-12P.
4. Check the power indicator light on the side on the cabinet.
5. Run the parent machine.
5. When the parent machine reaches desired operating speed, ensure that the minimum-speed indicator light on the EPC's front panel is illuminated.
5. Observe glue application.
6. Adjust the glue-flow control knob if necessary.

Glue Pressure at Startup and Shutdown

If the adhesive valves are closed before the parent machine speed is decreased, pressurized adhesive will be stored in the line between the regulator and the adhesive valve(s). If the application of adhesive is resumed at a lower operating speed, there will be a temporary overflow of adhesive. To prevent this, manually depressurize the adhesive line before resuming adhesive application. This can be accomplished after shut-down or before start-up.

Automatic depressurization can be provided with a relief valve at the output of the pressure regulator. The relief valve is wired parallel to the exhaust valve in the EPC-12P. Depressurization occurs according to parent machine speed and excess adhesive is dumped from the system.

Section 8—Maintenance

Introduction

This section contains maintenance instructions for the EPC-12P control.

General

- Inspect wiring for damage or wear.
- Inspect air lines for damage or leakage.

Manifold Air Valves

In most cases, the manifold air valves may be cleaned with air using the following procedure. However, if the needle valves are excessively dirty or plugged with adhesive, a valve overhaul or replacement may be required.

To clean the manifold air valves, follow these steps:

1. Turn off the parent machine.
2. Turn on the EPC-12P.
3. Turn on the air supply to the EPC-12P.
4. Turn the needle valve on the inlet-and-exhaust valve (Figure 8-1) 4-5 turns counterclockwise.

Note! *Do not turn the stop screw.*

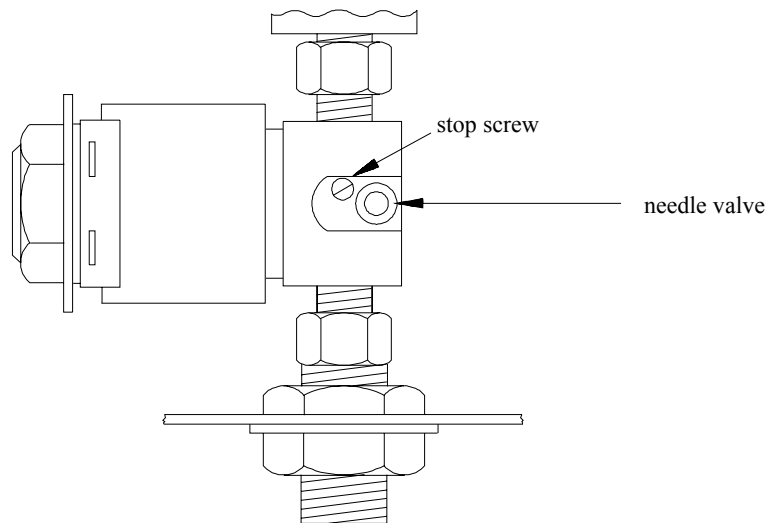


Figure 8-1. Stop Screw

5. Turn the pressure-transducer-zero adjustment (Figure 8-2) counterclockwise until the pressure-increase LED comes on.
6. Turn the pressure-transducer-zero adjustment clockwise until the pressure-decrease LED comes on.
7. Repeat steps 5 and 6 several times.
8. Turn the needle valve clockwise until it seats.
9. Turn the needle valve counterclockwise 1/8 of a turn.
10. Disconnect the inlet air line so that the manifold cannot receive air.

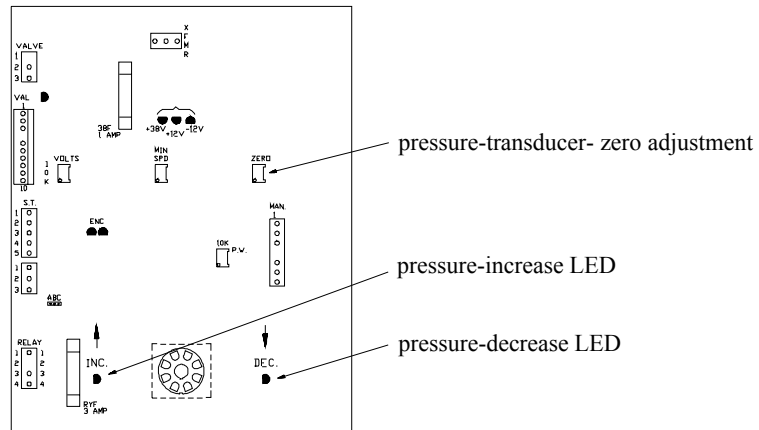


Figure 8-2. Pressure-Transducer-Zero Adjustment

11. If the pressure-increase LED is illuminated:
 - 11a. turn the pressure-transducer-zero adjustment clockwise until the LED goes off.
 - 11b. Continue to turn the adjustment clockwise until the pressure-decrease LED comes on.
 - 11c. Turn the adjustment counterclockwise to the middle position (about one half of a turn).
12. If the pressure-decrease LED is illuminated:
 - 12a. Turn the pressure-transducer-zero adjustment counterclockwise until the LED goes off.
 - 12b. Continue to turn the adjustment counterclockwise until the pressure-increase LED comes on.
 - 12c. Turn the adjustment clockwise to the middle position (about one half of a turn).

Cabinet

The EPC-12P cabinet should be closed unless adjustments, maintenance or service is required.

The exterior may be cleaned with a soft cloth and a mild soap and water solution. Automotive wax may be applied to protect the finish.

Do not use a water hose or steam to clean the exterior of the cabinet. If the parent machine is cleaned in this manner, cover the EPC-12P with plastic or other waterproof material.

Removing the Pressure Transducer

To remove the pressure transducer, follow these steps:

1. Remove the manifold terminal block (located behind the surge tank) from the circuit board.
2. Loosen the locking screws on the manifold terminal block for transducer wires 1, 2, and 3.
3. To remove the transducer, turn the transducer counterclockwise.
4. Reverse the procedure listed above to install a new transducer.

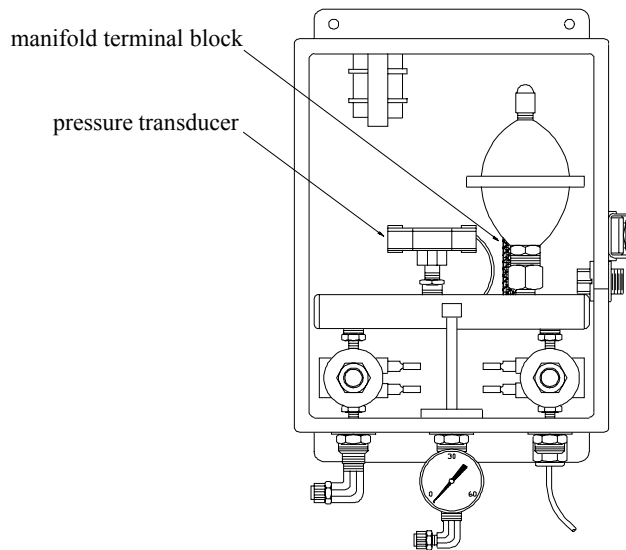


Figure 8-3. Pressure Transducer

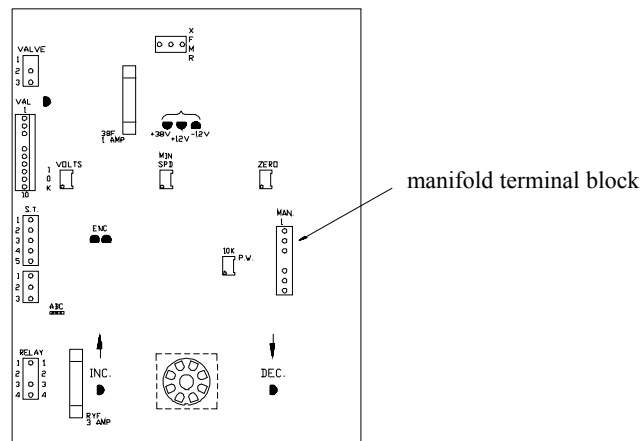


Figure 8-4. Manifold Terminal Block

Section 9—Troubleshooting

Introduction

This section contains troubleshooting procedures for the EPC-12P control.

EPC-12P Indicator Lights

The circuit board located inside the EPC-12P has eight indicator lights (LEDs) to assist in troubleshooting.

- **+12V LED**—Indicates power supply to the internal circuit board.
- **-12V LED**—Indicates power supply to the encoder circuit.
- **+38V LED**—Indicates power supply to the valve circuit.
- **Solenoid Valve LED**—Indicates power output from the minimum speed valve circuit. During proper operation, this LED operates in unison with the Minimum Speed Light on the front panel of the EPC-12P.
- **Encoder LEDs (2)**—The LED on the left side is illuminated when the encoder output is 12V. The LED on the right side is illuminated when the encoder output is zero volts. The square wave output of the encoder is 12V (average 6V). During normal operation, both LEDs will appear illuminated at the same time with equal brightness. The brightness of the LEDs will be proportional to machine speed.
- **Pressure-Increase LED**—Indicates that the inlet solenoid is activated (open).
- **Pressure-Decrease LED**—Indicates that the exhaust solenoid is activated (open).

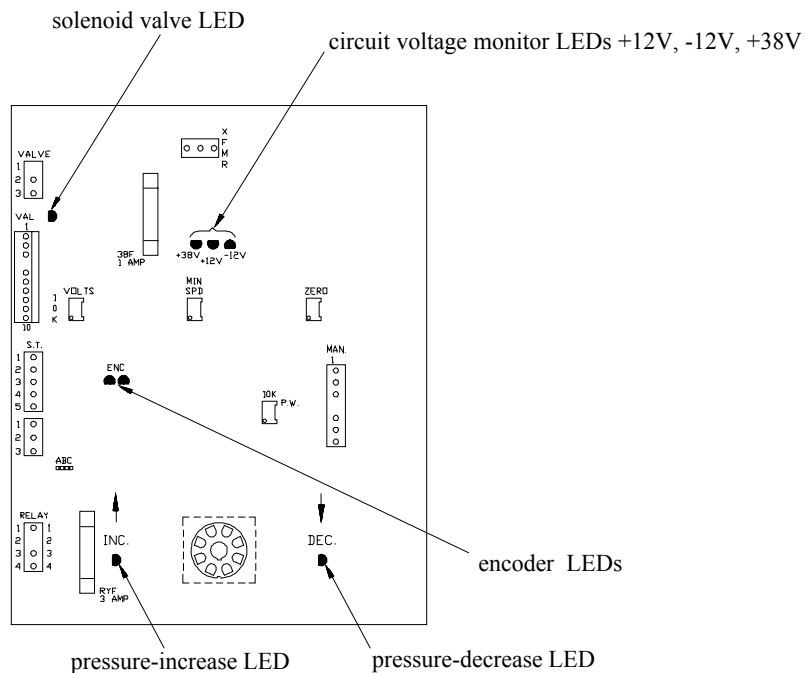


Figure 9-1. Indicator Lights

PROBLEM	POSSIBLE CAUSE	SOLUTION
Power indicator light not illuminated	<ul style="list-style-type: none"> • Line fuse is out • Faulty service cable connections • Damaged service cable • No electrical service 	<p>Replace fuse with 1 amp, 250V slow-blow.</p> <p>Repair.</p> <p>Repair or replace.</p> <p>Check plant's power supply.</p>
+12V, -12V, and +38V LEDs are not illuminated	<ul style="list-style-type: none"> • Faulty transformer connections • Faulty transformer • Faulty circuit board 	<p>Repair.</p> <p>Replace.</p> <p>Replace circuit board.</p>
Only -12V LED is not illuminated	<ul style="list-style-type: none"> • Thermal overload of circuit 	<p>Repair or replace encoder cable.</p>
Only +38V LED is not illuminated	<ul style="list-style-type: none"> • +38V fuse is out • Faulty circuit board 	<p>Replace fuse.</p> <p>Replace circuit board.</p>
Solenoid valve LED is illuminated, but the minimum speed light is not illuminated	<ul style="list-style-type: none"> • Minimum speed light is out 	<p>Replace light.</p>
Solenoid valve LED is not illuminated, but the minimum speed light is illuminated	<ul style="list-style-type: none"> • Faulty circuit board 	<p>Replace circuit board.</p>
One encoder LED is illuminated, the other encoder LED is not illuminated	<ul style="list-style-type: none"> • Encoder is not rotating • Encoder cable is damaged 	<p>Check encoder assembly.</p> <p>Replace cable.</p>
One encoder LED is much brighter than the other encoder LED	<ul style="list-style-type: none"> • Faulty encoder operation 	<p>Replace encoder.</p>

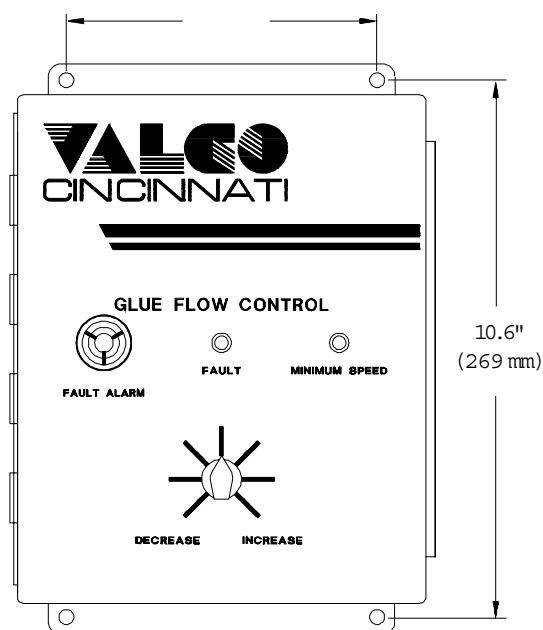
PROBLEM	POSSIBLE CAUSE	SOLUTION
<p>Fault light illuminated and aural alarm has been activated</p>	<ul style="list-style-type: none"> • EPC-12P power is ON but the air supply is OFF. • Leak in output hose or fitting • Inlet or exhaust valve is dirty • Adhesive visible in the clear portion of the manifold output tubing • Solenoid coil malfunction • Transducer malfunction 	<p>Turn EPC-12P OFF.</p> <p>Repair.</p> <p>See “Manifold Air Valves” in the “Maintenance” section of this manual.</p> <p>Replace ruptured diaphragm in the pressure regulator and clean the system. See “Manifold Air Valves” in the “Maintenance” section of this manual.</p> <p>Replace.</p> <p>Replace.</p>
<p>All LEDs are operating properly but adhesive flow does not follow machine speed</p>	<ul style="list-style-type: none"> • Output air line plugged 	<p>Check pressure regulator for ruptured diaphragm and clean output air line.</p>

Section 10—Specifications

Introduction

This section contains specifications for the 4400 hot-melt unit.

Enclosure	NEMA-12 type
Width	14.5" (368mm)
Height	9" (229mm)
Depth	7" (178mm)
Power supply	100/200VAC or 115/230VAC, 50/60 Hz., single-phase
Valve circuit	24VDC, 8.5 watt maximum, turn on (off) point adjusted by minimum-speed setting
Inputs	Single encoder
Outputs	Manifold air pressure proportional to parent-machine speed
Options	240VAC, 3-amp maximum relay Dump valve Web-detection scanner Purge switch



Section 11—Part-Number List

How to Order Parts

To order parts, please contact one of the following offices:

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

Storkower Str.
15749 Gallun, Germany
TEL: (+49) 337 648 700
FAX: (+49) 337 648 7070

Note! You may also contact a Valco sales representative in your country.

Parts List

Description	Part Number
EPC-12P automatic flow control, 115/230VAC	080xx540
EPC-12P automatic flow control, 100/200VAC	080xx541
EPC-12P circuit board	151xx341
Potentiometer	140xx007
Transformer (115/230VAC)	036xx143
Transformer (100/200VAC)	036xx144
Solenoid air valve	411xx400
Pressure transducer	520xx004
Fuse, 1 amp slow-blow (package of 5)	085xx001
Encoder, VCE-250	155xx027
Encoder, VCE-500	155xx029
Encoder, VCE-1000	155xx031
Encoder cable, 33 ft. (10 m)	030xx003
Encoder cable, 66 ft. (22 m)	030xx008
Timing belt	788xx300
Measuring wheel, 10" (254mm)	788xx553
Optional relay (12V)	160xx005
Optional relay fuse, 240V, 3-amp, slow-blow	085xx007

Section 12—Warranty

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.

Section 13—Service

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—Encoder Selection

Introduction

The encoder can be driven with either a measuring wheel or a line-shaft assembly. Use the appropriate encoder for the drive method being used. The measuring wheel can be used over the entire speed range of the parent machine. However, there are low-speed limitations associated with the line shaft assembly method.

To determine which type of encoder should be used, follow these steps:

1. Choose a shaft on the parent machine. (This shaft will drive the encoder.)
2. Measure diameter of the shaft and record the value in Chart 1. (Measure to within + .001" or + .02 mm.)
3. Determine the amount of product travel per revolution of the shaft (inches or millimeters per revolution), and record the value in Chart 1.
4. Determine the maximum parent machine speed in feet or meters per minute, and record the value in Chart 1.

Chart 1.

Diameter of shaft (inches or millimeters)	
Amount of product travel per shaft revolution (inches or millimeters per revolution)	
Maximum parent-machine speed	

Encoder Selection Chart for Line-Shaft Application (Imperial Measurement)

Amount of Product Travel Per Shaft Revolution
(inches per revolution)

	5	10	15	20	25	30	35			
Product Speed (feet per minute)	1800	0.68	0.95	1.22	1.49	1.76	2.03	Pulley ratios for VCE-250 encoder		
	1700	0.71	1.00	1.29	1.57	1.86	2.14			
	1600	0.76	1.06	1.36	1.67	1.97	2.27			
	1500	0.81	1.13	1.45	1.77	2.10	2.42			
	1400	0.86	1.21	1.55	1.90	2.24	2.59			
	1300	0.93	1.30	1.67	2.04	2.41	2.78			
	1200	1.00	1.40	1.80	2.20	2.60	3.00			
	1100	1.09	1.52	1.96	2.39	2.83	3.26			
	1000	0.71	1.19	1.67	2.14	2.62	3.10		3.57	
	900	0.79	1.32	1.84	2.37	2.89	3.42		3.95	
	800	0.88	1.47	2.06	2.65	3.24	3.82		4.41	
	700	1.00	1.67	2.33	3.00	3.67	4.33		2.50	Pulley ratios for VCE-500 encoder
	600	1.15	1.92	2.69	3.46	4.23	2.50		2.88	
	500	1.36	2.27	3.18	4.09	2.50	2.96		3.40	
400	1.67	2.78	3.89	2.50	3.06	3.62	4.16			
300	2.14	3.57	2.50	3.22	3.92	4.64	5.36			
200	3.00	2.50	3.50	4.50	5.50	6.50	7.50	For VCE-1000		
100	1.25	2.08	2.92	3.75	4.58					

Encoder Selection Chart for Line-Shaft Application (Metric Measurement)

Amount of Product Travel Per Shaft Revolution
(millimeters of product travel per shaft revolution)

		200	250	300	350	400	450	500	550	600		
Product Speed (meters per minute)	550				0.76	0.87	0.98	1.09	1.20	1.31	Pulley ratios for VCE-250 encoder	
	500	Use VCE-250 with measuring wheel			0.72	0.84	0.96	1.08	1.20	1.32		1.44
	450				0.80	0.93	1.07	1.20	1.33	1.47		1.60
	400			0.75	0.90	1.05	1.20	1.35	1.50	1.65		1.80
	350			0.86	1.03	1.20	1.37	1.54	1.74	1.89		2.06
	300	0.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40		
	250	0.96	1.20	1.44	1.68	1.92	2.16	2.40	2.64	2.88		
	200	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.30	3.60		
	150	1.60	2.00	2.40	2.80	3.20	3.60	4.00	4.40	4.80		
	100	2.40	3.00	3.60	4.20	4.80	2.70	3.00	3.30	3.60		
50	4.80	3.00	3.60	4.20	4.80	5.40	6.00	6.60	7.20			
25	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.30	3.60			

Drive Pulley and Encoder Pulley Combinations

Drive Pulleys

Teeth	48	60	72	92
Maximum bore, inches	1.75	2.50	3.25	4.50
Maximum bore, millimeters	444	635	825	1143

Number of Encoder Pulley Teeth	18	2.67	3.33	4.00	5.11
	20	2.40	3.00	3.60	4.60
	21	2.29	2.86	3.43	4.38
	22	2.18	2.73	3.27	4.18
	24	2.00	2.50	3.00	3.83
	28	1.71	2.14	2.57	3.29
	30	1.60	2.00	2.40	3.06
	32	1.50	1.88	2.25	2.88
	36	1.33	1.67	2.00	2.56
	40	1.20	1.50	1.80	2.30
	42	1.14	1.43	1.71	2.19
	44	1.09	1.36	1.64	2.09
	48	1.00	1.25	1.50	1.92
	60	0.80	1.00	1.20	1.53

Encoder Selection Chart for Measuring-Wheel Application

Imperial		Metric	
Maximum machine speed (feet per minute)	Encoder	Maximum machine speed (meters per minute)	Encoder
0 - 100	VCE-1000	0 - 30	VCE-1000
100 - 300	VCE-500	30 - 90	VCE-500
300 - 1800	VCE-250	90 - 550	VCE-250