ROBERTS GORDON

System Control

Installation, Operation & Service Manual

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can result in death, injury or property damage. Read the installation and operation manuals thoroughly before installing or servicing this equipment.

Installation must be done by an electrician qualified in the installation of control systems for heating equipment.

Installer

Please take the time to read and understand these instructions prior to any installation. Installer must give a copy of this manual to the owner.

Owner

Keep this manual in a safe place to provide your serviceman with information should it become necessary.

Roberts-Gordon
1250 William Street
P.O. Box 44
Buffalo, New York 14240-0044
Telephone: 716.852.4400
Fax: 716.852.0854
Toll Free: 800.828.7450

http://www.rg-inc.com

Roberts-Gordon Canada Inc.
241 South Service Road West
Grimsby, Ontario L3M 1Y7 Canada
Telephone: 905.945.5403
Fax: 905.945.0511

Roberts-Gordon
Oxford Street
Bilston, West Midlands WV14 7EG UK
Telephone: +44 (0) 1902 494425
Fax: +44 (0) 1902 403200

c UL us LISTED

Quality in Any Language™

10091601NA Rev B 06/00

▶TABLE OF CONTENTS

▶TABLE OF FIGURES

Printed in the U.S.A.

▶SECTION 1: INTRODUCTION

1.1 WHAT IS A ROBERTS GORDON® SYSTEM CONTROL?

The ROBERTS GORDON® System Control is an electronic controller designed for the control of CORAYVAC® and VANTAGE® EV systems.

The System Control is capable of giving four zones of temperature control. The control will give power output to one pump.

1.2 GENERAL REQUIREMENTS

Failure to comply with the installation instructions will invalidate the limited warranty set out on *Page 11, Section 7*.

The cable used for all wiring must be rated for line voltage up to 250V.

Failure to follow these instructions will result in death or electrical shock.

The system control, burners, pump and outside air blower must be electrically grounded in accordance with the *National Electrical Code®* ANSI/NFPA 70 - latest revision.

Before proceeding with the installation of the ROBERTS GORDON® System Control, check the following points:

1.3 CHECK INSTALLATION MATERIALS

1.3.1 Thermostats

Only use 24V thermostats with the ROBERTS GORDON® System Control. Do not use "power stealing" 24V thermostats. ROBERTS GORDON® offers a selection of low voltage thermostats approved for use with the system control.

The thermostats measure the air temperature in the building. It is important that the thermostat is located in an area within the heated zone at occupant level. Do not place thermostat in an area shaded from the low-intensity, infrared heating system.

1.3.2 Electrical Installation Materials

A 1ph 16A, 120V power supply to the control panel must be installed in accordance with the most current *National Electrical Code®*, local codes and any site specific diagrams.

Total load powered by the panel must not exceed 16A. Loads totaling more than 16A must be powered from an additional power supply circuit by the use of a load relay package.

1.3.3 Outside Air Supply Blower

If used, the optional outside air blower is to be controlled in parallel with the pump. The blower incorporates a pressure switch which must be wired in series with the vacuum proving switch on the pump. The load relay package is required with the blower. See *Page 7, Section 4, Figure 8,* for wiring detail.

1.3.4 Vacuum Proving Switch

A vacuum proving switch (P/N 90430600), preset at 1.7" w.c. is required for installation on the inlet of the pump. This switch is required to interlock the operation of the pump with the control panel.

⚠ CAUTION

Proving switch must be installed on all ROBERTS GORDON® systems to ensure safety and operation.

System will not operate without proving switch.

Failure to follow these instructions can result in product damage.

1.4 SAFETY

Your Safety is Important to Us! This symbol is used throughout the manual to notify you of possible fire, electrical or burn hazards. Please pay special attention when reading and following the warnings.

⚠ WARNING

Installation, Service and Annual Inspection of controller must be done by an electrician qualified in the installation of control systems for heating equipment.

Installation, Service and Annual Inspection must be done by a contractor qualified in the installation and service of gas-fired heating equipment.

Read this manual carefully before installation, operation, or service of this equipment.

Failure to follow these instructions can result in death, injury or property damage.

For optimum heater performance and safe heating conditions, inspect and maintain heater(s) before every heating season and as necessary. Also, know and maintain heater clearances to combustibles, see heater Installation, Operation and Service manual for further details. If you require additional manuals, contact your ROBERTS GORDON® independent distributor or Roberts-Gordon at (716) 852-4400 or (800) 828-7450 in the U.S., (905) 945-5403 in Canada or at www.rg-inc.com.

▶SECTION 2: SPECIFICATIONS

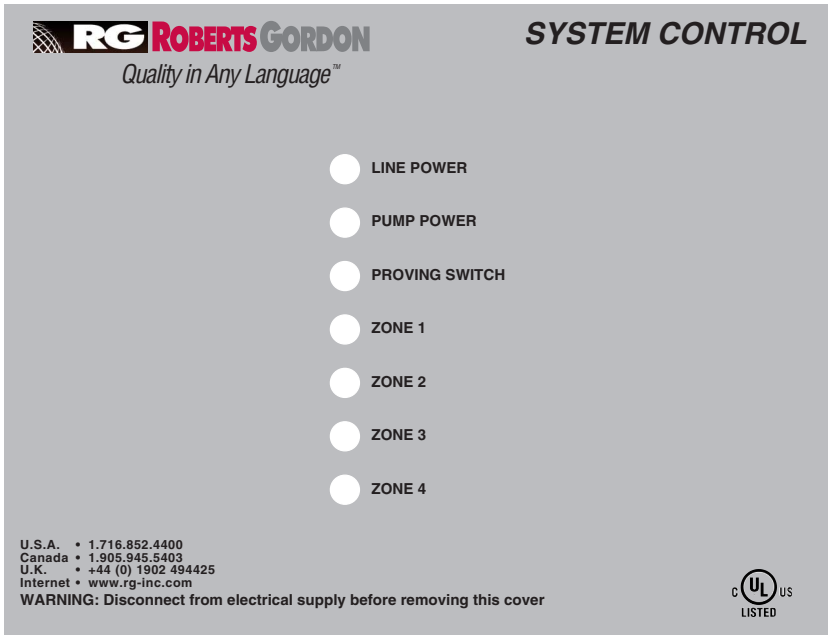


FIGURE 1 - Panel Layout

2.1 MATERIAL SPECIFICATION

Enclosure Material:	ABS (UL 94-5VA Rated)
Weight:	1.1 lbs
Dimensions:	7.9" x 11.4" x 2.4" (199 x 290 x 62 mm)
Protection:	Rating IP20

2.2 ELECTRICAL SPECIFICATION

Supply:	16A 120V 50/60Hz
Zone Relay:	Single pole 4.4A 120V AC (resistive)
Pump Relay:	Single pole 12A 120V AC (resistive) 1HP motor rated.
Thermostats:	Low voltage 12V DC

2.3 PUMP SPECIFICATIONS

	Full load current: 1ph	3ph
EP 100 pump 1/3HP:	4.8A	N/A
EP 200 series pumps 3/4HP:	6.6A	3.0A
EP 300 series pumps 1-1/2 HP:	16.0A	4.2A

2.4 BURNER ELECTRICAL RATINGS

CORAYVAC® burners: 120V, 60Hz, 1ph 0.2A
VANTAGE® EV burners: 120V, 60Hz, 1ph 0.2A

2.5 OUTSIDE AIR SUPPLY BLOWER

2.2A Run (Full load current) at 120V, 60Hz, 1ph, 2.2A

2.6 INDICATOR LIGHTS *(PAGE 2, SECTION 2, FIGURE 1)*

1. LINE POWER, when lit, indicates supply on to the panel.
2. PUMP POWER, when lit, indicates the relay for power to the pump is energized.
3. PROVING SWITCH, when lit, indicates that the proving switch is closed.
4. ZONE, when lit, indicates which zone relay is on.

2.7 TERMINAL BLOCK GUIDE

Page 2, Section 2, Figure 2 is a guide to the terminal abbreviations.

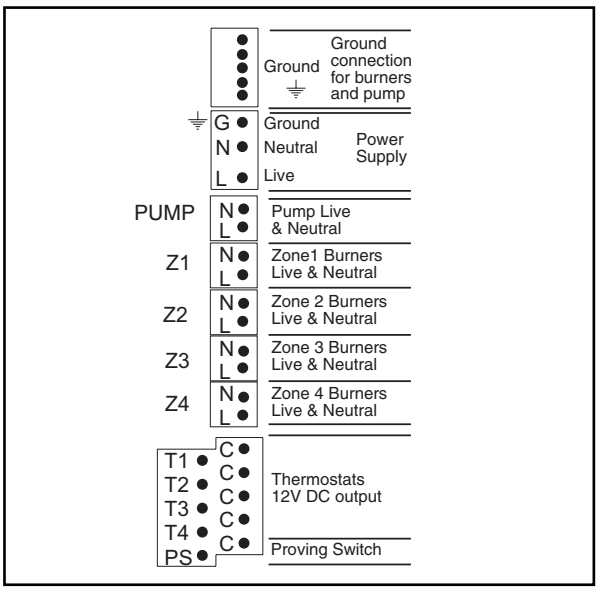


FIGURE 2 - Terminal Block Guide

▶SECTION 3: INSTALLATION

Installation of the System Control and the associated external electrical wiring must be completed by an electrician qualified in the installation of control systems for heating equipment.

3.1 PREPARATION

Before installing the System Control, observe the following:

3.1.1 Ensure that you have a copy of the site layout for the project that identifies clearly the separate zones.

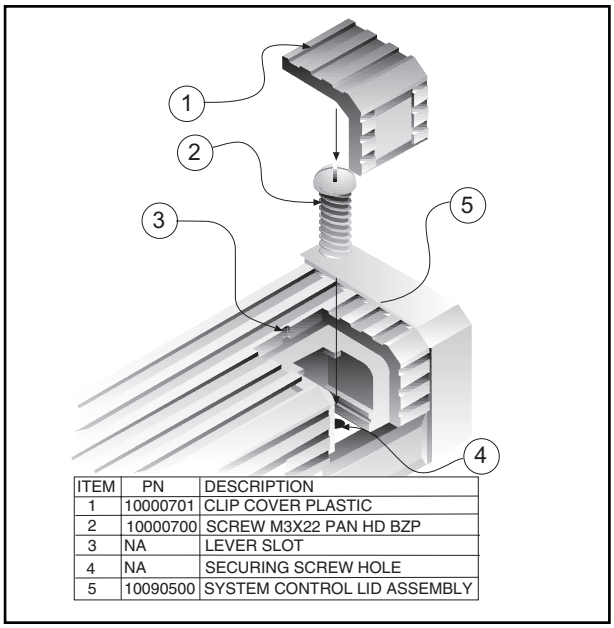
3.1.2 Read *Page 1, Section 1.3* carefully to ensure the correct installation materials are available.

3.2 INSTALLING THE SYSTEM CONTROL PANEL

3.2.1 Choose a mounting location for the System Control. It is advisable to choose a visible location near the pump.

3.2.2 Remove the cover of the System Control by removing the four securing screws.

See *Page 3, Section 3, Figure 3* for cover detail. Pry the clip off using a flat blade screw driver in the groove (3). This will reveal the securing screw (2). Repeat this for each corner of the cover.



ITEM	PN	DESCRIPTION
1	10000701	CLIP COVER PLASTIC
2	10000700	SCREW M3X22 PAN HD BZP
3	NA	LEVER SLOT
4	NA	SECURING SCREW HOLE
5	10090500	SYSTEM CONTROL LID ASSEMBLY

FIGURE 3 - System Control Cover Detail

3.2.3 Disconnect the ribbon cable from the System Control panel board. Place the cover and the hardware in a safe place for refitting after the external wiring connections have been made.

3.2.4 Position the mounting hole location of the System Control per *Figure 4, Section 3*.

3.2.5 Remove the knockouts required for the conduit entry into the System Control panel.

3.2.6 Fit the cable plate, provided with the System Control Panel, in the slot at the top of the System Control panel.

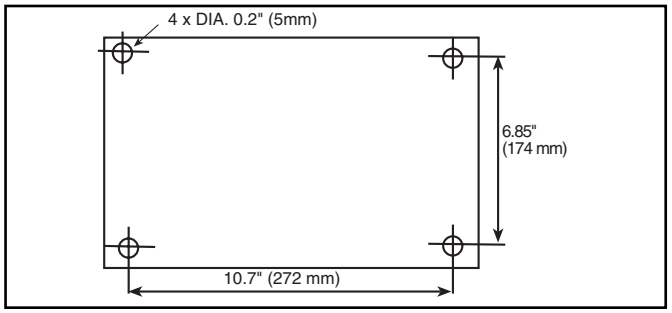


FIGURE 4 - Mounting Hole Layout

3.3 SELECT THE EXTERNAL WIRING DIAGRAM FOR THE INSTALLATION

3.3.1 Use *Page 4, Section 4, Figure 5* for the external wiring of the burners, thermostats and pressure switch.

3.3.2 Use the table below to select the correct pump external wiring diagram.

Pump	Supply Voltage	Page	Section	Figure
EP 100	120V 1ph	4	4	5
EP 201	120V 1ph	4	4	5
EP 301	120V 1ph	5	4	6
EP 203	230V 3ph	6	4	7
EP 303	230V 3ph	6	4	7

Roberts-Gordon provides, at an additional cost, the following IEC contactor and enclosure **required for the EP 301 pump**, the part numbers are listed below.

For 120V AC Connection

P/N	Description
10050006	**Contactor 120V AC EP 301 1ph**
10001705	Contactor IEC 16A 120V AC
10001001	Enclosure IEC metal 8” x 5” x 5” Nema 1

Roberts-Gordon provides, at an additional cost, the following IEC contactor and overload starter package required for 3ph pumps, the contents are listed below:

P/N	Description
10050001	**Starter 120V AC EP 203/303 3ph**
10001001	Enclosure IEC metal 8" x 5" x 5" Nema 1
10001701	Contactor IEC 9A 120V AC
10001706	Overload IEC 1.6-5.0A 3ph

3.3.3 If an outside air blower is to be used with any of the above options, see *Page 7, Section 4, Figure 8*, or the external wiring diagram.

3.4 *IMPORTANT:* VOLTAGE SELECTION

The System Control can be used with either 115V or 230V single phase. **Ensure the voltage selector switch is set to 115V**. See *Page 9, Section 6, Figure 10, ITEM 2.*

▶SECTION 4: TYPICAL EXTERNAL WIRING DIAGRAMS

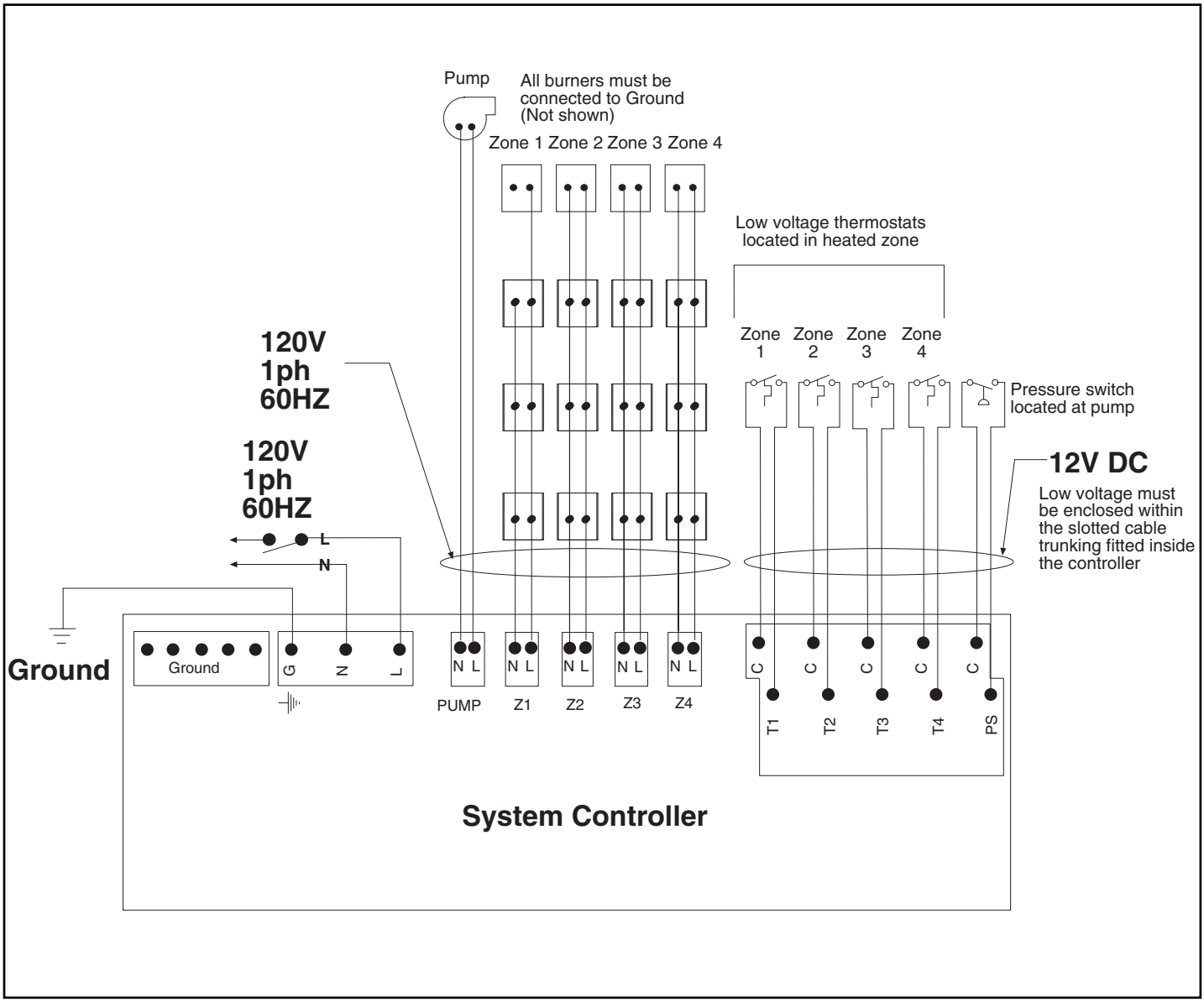


FIGURE 5 - External Wiring Diagram ROBERTS GORDON® EP 100 and EP 201 120V 1ph Pump

4.1 EP 100 OR EP 201 120V 1PH PUMP EXTERNAL WIRING DIAGRAM

The external wiring diagram above shows the connections for four zones of system burners. System burners can be either CORAYVAC® or VANTAGE® EV.

The zones are connected to a single pump. The external wiring diagram above shows connection to an EP 100 or EP 201 pump.

4.1.1 External wiring connection details

The cable used for all the wiring must be rated for line voltage up to 250V.

The low voltage circuit conforms with Class 2 separation of circuit requirements. National Electrical Codes® for wiring class 2 low voltage circuits must be followed. Disconnect electrical supply before servicing.

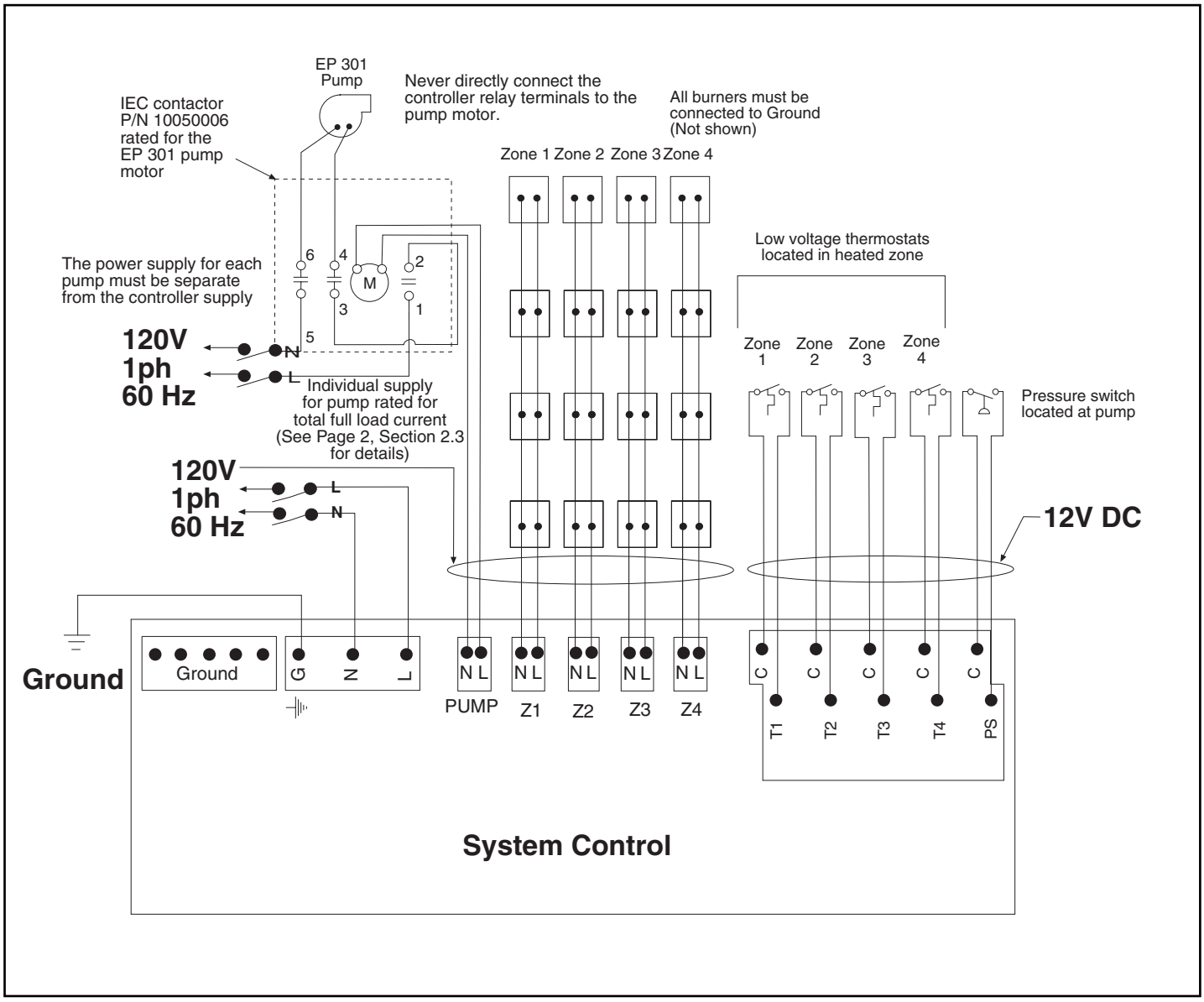


FIGURE 6 - External Wiring Diagram ROBERTS GORDON® EP 301 120V 1ph Pump

4.2 EP 301 120V 1PH EXTERNAL WIRING DIAGRAM

The external wiring diagram above shows the connections for four zones of system burners. System burners can be either CORAYVAC® or VANTAGE® EV.

The zones are connected to a single pump. The external wiring diagram above shows connection to an EP 301 1ph motor.

4.2.1 External wiring connection details

The cable used for all the wiring must be rated for line voltage up to 250V.

The low voltage circuit conforms with Class 2 separation of circuit requirements. National Electrical Codes® for wiring class 2 low voltage circuits must be followed. Disconnect electrical supply before servicing.

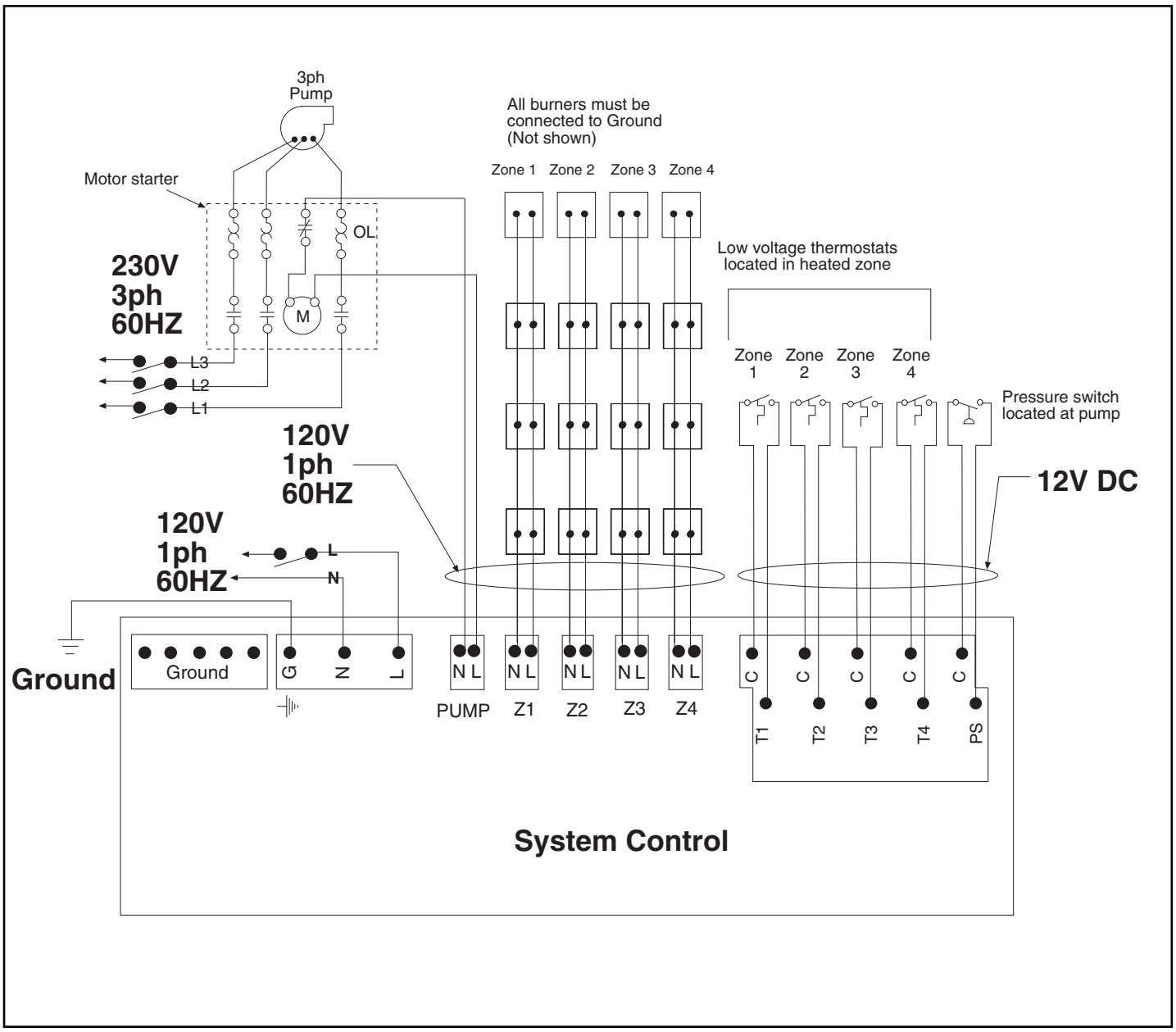


FIGURE 7 - External Wiring Diagram EP 203 and EP 303 230V 3ph Pump

4.3 EP 203 OR EP 303 230V 3PH PUMP EXTERNAL WIRING DIAGRAM

The external wiring diagram above shows the connections for four zones of system burners. System burners can be either CORAYVAC® or VANTAGE® EV.

The zones are connected to a single pump. The external wiring diagram above shows connection to an EP 203 or EP 303 3ph pump.

4.3.1 External Wiring Connection Details

The cable used for all the wiring must be rated for line voltage up to 250V.

The low voltage circuit conforms with Class 2 separation of circuit requirements. National Electrical Codes® for wiring class 2 low voltage circuits must be followed. Disconnect electrical supply before servicing.

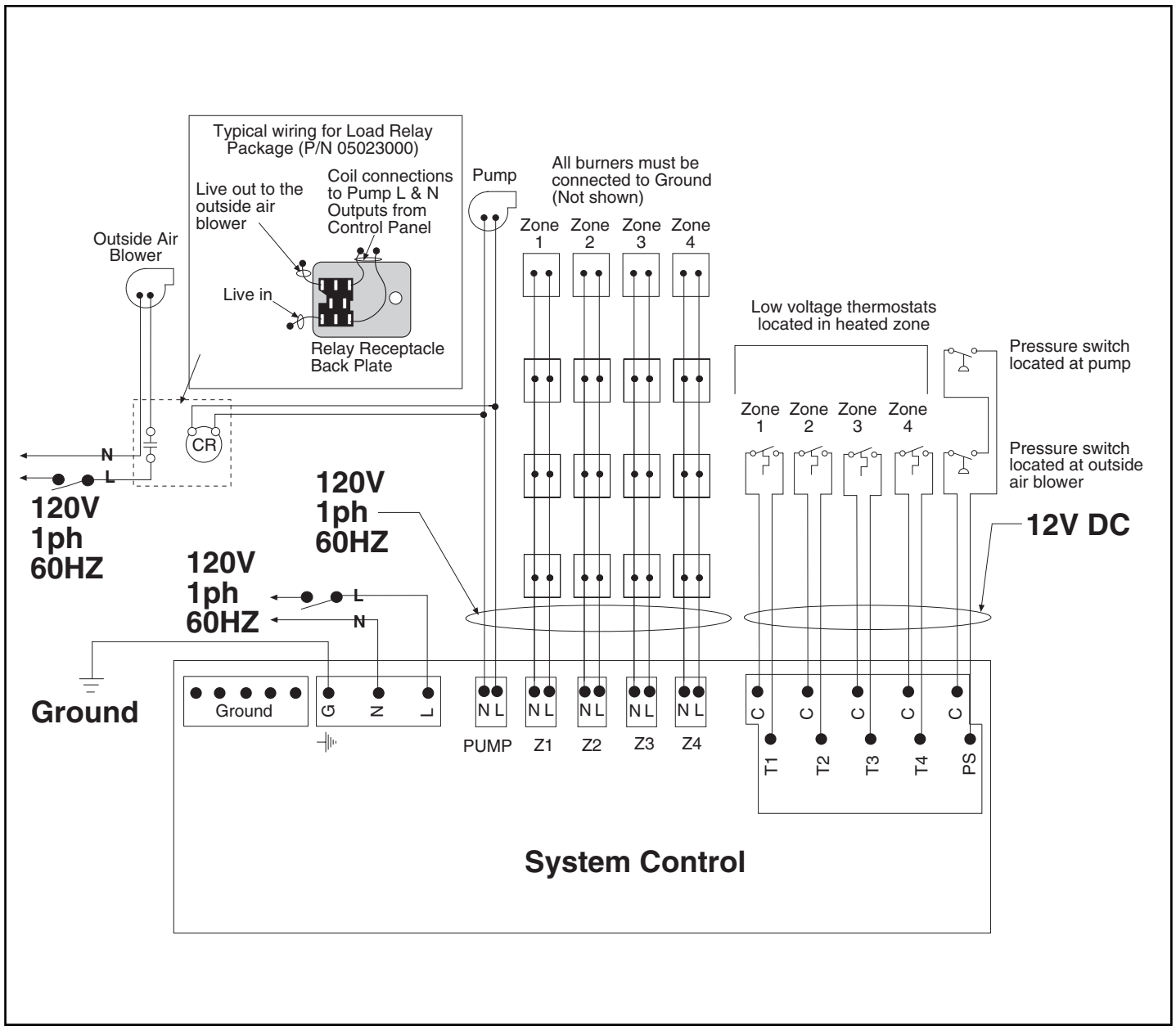


FIGURE 8 - External wiring diagram ROBERTS GORDON® EP 100 or EP 201 120V 1ph Pump with outside air blower

4.4 OUTSIDE AIR BLOWER EXTERNAL WIRING DIAGRAM

The external wiring diagram above shows the connections for four zones of system burners. System burners can be either CORAYVAC® or VANTAGE® EV.

The zones are connected to a single pump. The external wiring diagram above shows connection to an EP 100 or EP 201 1ph motor. The diagram also shows the connection via a load relay to the optional outside air blower.

4.4.1 External Wiring Connection Details

The cable used for all the wiring must be rated for line voltage up to 250V.

The low voltage circuit conforms with Class 2 separation of circuit requirements. National Electrical Codes® for wiring class 2 low voltage circuits must be followed. Disconnect electrical supply before servicing.

▶SECTION 5: TROUBLESHOOTING

5.1 SEQUENCE OF OPERATION

a. On demand for heat, the panel will send power to the pump. The pump will begin operation.

b. Once vacuum is established, the vacuum proving switch at the pump will close.

c. The panel sends power to the burners. The burners will go through a 45 second purge and cycle time.

d. Once flame is established, the heater will remain in operation until such time as either a lockout condition occurs or the heating is turned off by the thermostat.

e. After the heating is turned off, the pump will continue operation for 2 minutes, post purge.

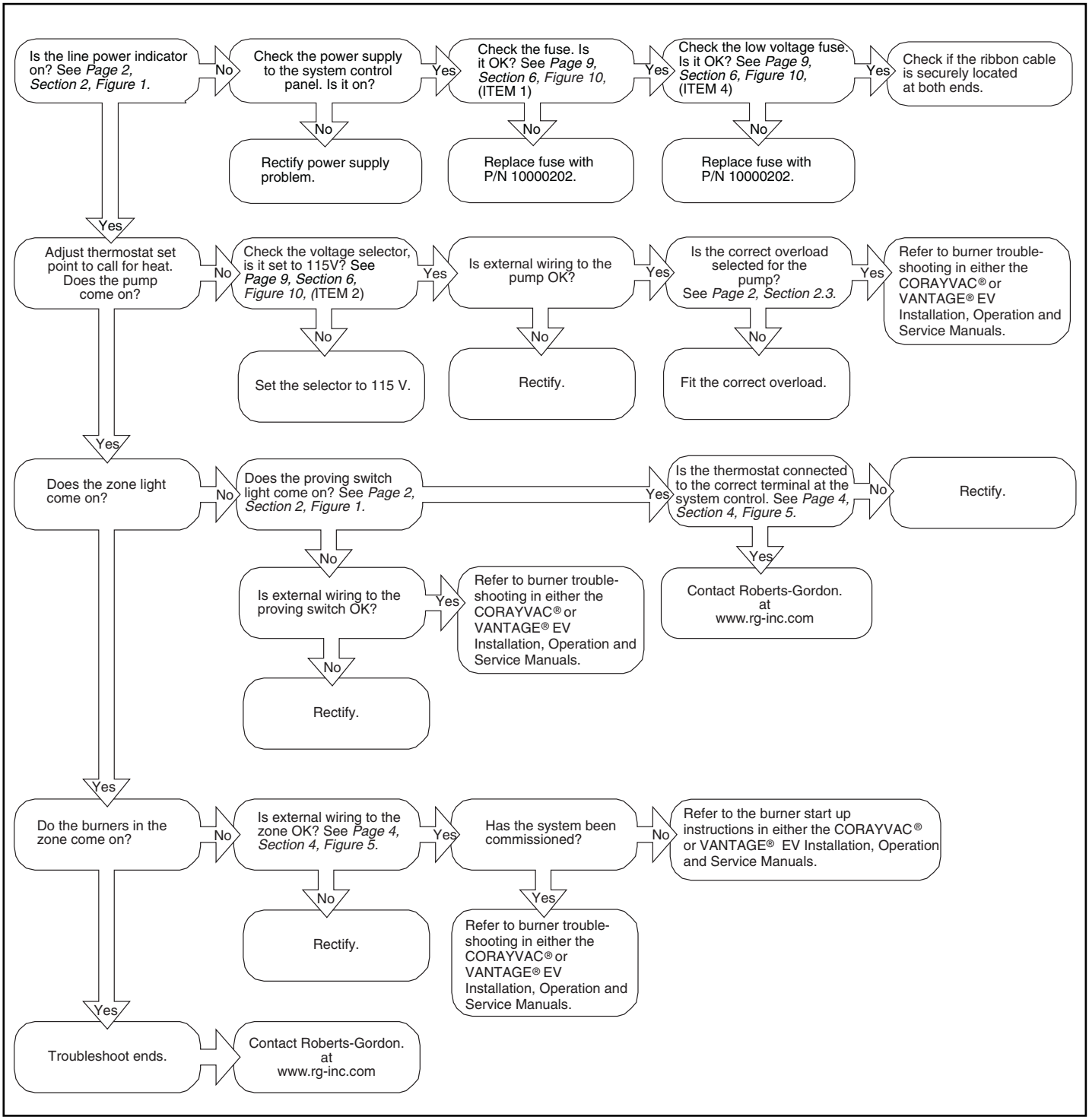


FIGURE 9 - System Control Troubleshooting Chart

▶SECTION 6: REPLACEMENT PARTS

⚠ WARNING

Use only genuine ROBERTS GORDON® replacement parts.

Use of parts not specified by Roberts-Gordon voids warranty.

Failure to follow these instructions can result in death, injury or property damage.

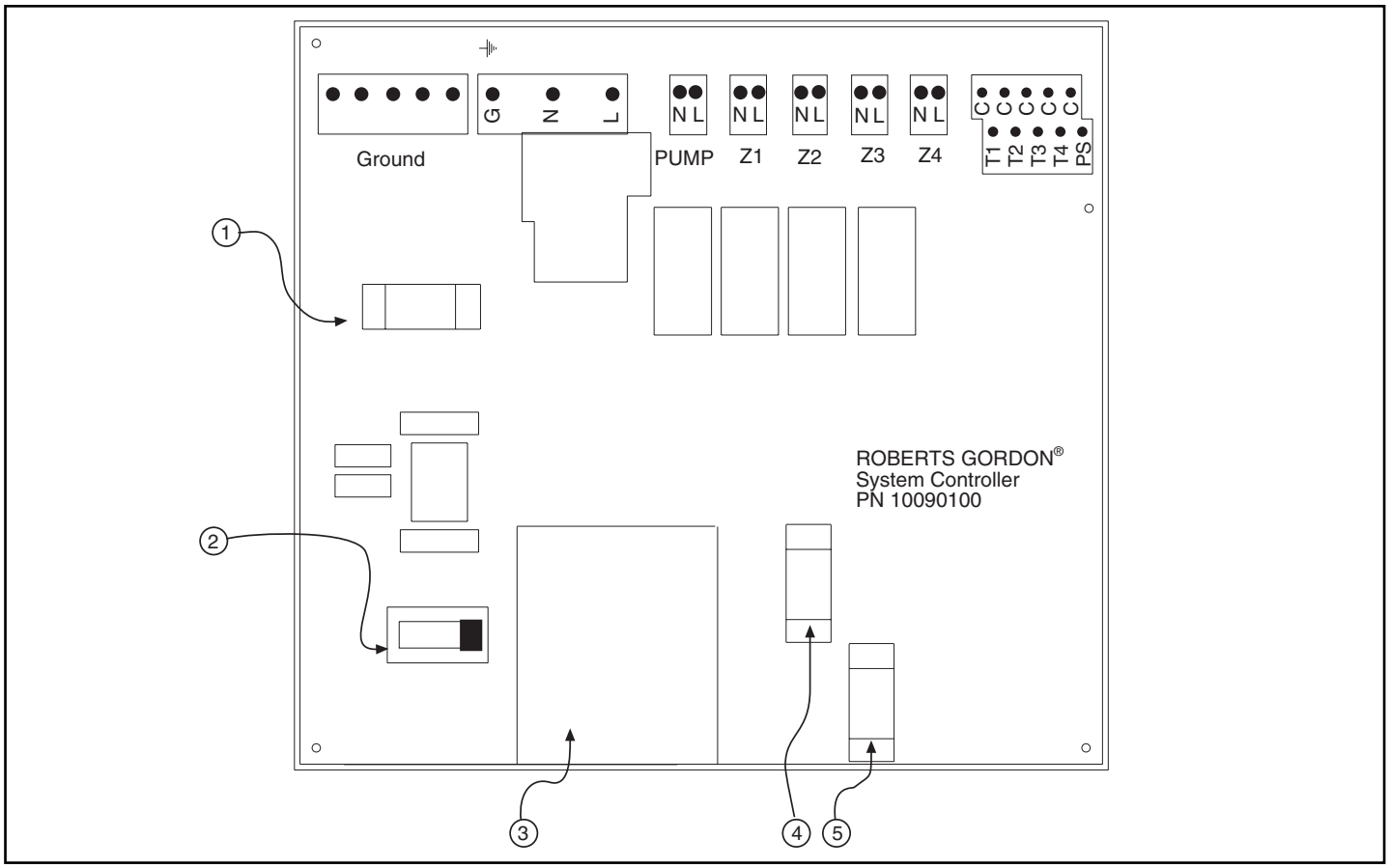


FIGURE 10 - System Control Internal Components Diagram

6.1 REPLACEMENT PARTS LIST

Part Number	Description
1. 10000202	Fuse Anti Surge 500mA
2. NA	Voltage Selector Switch
3. NA	Transformer
4. 10000202	Fuse Anti Surge 500mA
5. 10000200	Fuse Fast Blow 315mA
6. 10000702	Cable Entry Plate *not shown*
7. 10000703	Clip Cover and Screw (4 pack) *not shown*

6.2 REPLACEMENT PARTS INSTRUCTIONS

⚠ WARNING

Electrical Shock Hazard

Disconnect electrical supply before performing service or maintenance.

Failure to follow these instructions will result in death or electrical shock.

6.2.1 10000202 Fuse Anti Surge 500mA

This fuse protects the System Control from power surges, lightning and incorrect wiring.

If the fuse needs replacing, the following steps must be taken.

Turn off the power to the System Control.

Remove the clips and screws from the cover and remove the cover of the System Control. See *Page 3, Section 3.2.2* for details.

Disconnect the ribbon cable from the Main Board only, leaving the ribbon attached to the cover.

Locate the fuse *(Page 9, Section 6, Figure 10,* ITEM 1*)* and remove the fuse with a fuse pulling tool.

Replace with a new fuse rated at 500mA anti surge.

Reconnect the ribbon cable to the Main Board and replace cover.

6.2.2 Voltage Selector Switch

The voltage selector switch must display 115V for use in North America.

6.2.3 Transformer

The transformer on the board cannot be replaced.

6.2.4 10000202 Fuse Anti Surge 500mA

This fuse protects the System Control circuit board.

If the fuse needs replacing, the following steps must be taken.

Turn off the power to the System Control.

Remove the clips and screws from the cover panel and remove the cover of the System Control. See *Page 3, Section 3.2.2* for details.

Disconnect the ribbon cable from the Main Board only, leaving the ribbon attached to the cover.

Locate the fuse *(Page 9, Section 6, Figure 10,* ITEM 4*)* and remove the fuse with a fuse pulling tool.

Replace with a new fuse rated to 500mA anti surge.

Reconnect the ribbon cable to the Main Board and replace cover.

6.2.5 10000200 Fuse Fast Blow 315mA

This fuse protects the inputs connected to the System Control circuit board.

If the fuse needs replacing, the following steps must be taken:

Turn off the power to the System Control.

Remove the clips and screws from the cover panel and remove the cover of the System Control. See *Page 3, Section 3.2.2* for details.

Disconnect the ribbon cable from the Main Board only, leaving the ribbon attached to the cover.

Locate the fuse *(Page 9, Section 6, Figure 10,* ITEM 5*)* and remove the fuse with a fuse pulling tool.

Replace with a new fuse rated to 315mA fast blow.

Reconnect the ribbon cable to the Main Board and replace cover.

▶SECTION 7: THE ROBERTS GORDON® SYSTEM CONTROL WARRANTY

ROBERTS-GORDON WILL PAY FOR:

For 36 months from the date of purchase by the original consumer or 18 months from date of shipment by Roberts-Gordon, whichever occurs first: we will provide, free of charge, replacement parts for any part of the ROBERTS GORDON® System Control that fails because of a manufacturing or material defect.

ROBERTS GORDON® replacement parts are warranted for the period of the original ROBERTS GORDON® System Control Warranty.

ROBERTS-GORDON WILL NOT PAY FOR:

Service trips, service calls and labor charges.

Shipment of replacement parts.

Damage due to:

Failure to install, operate or maintain the ROBERTS GORDON® System Control as directed in Installation, Operation and Service Manual. You must follow requirements printed in this manual.

Misuse, abuse, neglect or modification of the ROBERTS GORDON® System Control in any way.

Improper service, use of replacement parts or accessories that are not specified by Roberts-Gordon.

Improper installation, or any relocation of the ROBERTS GORDON® System Control after initial installation.

Incorrect supply, accident, fire, flood, acts of God or other casualty.

Use of the ROBERTS GORDON® System Control for other than its intended purpose.

Use of the ROBERTS GORDON® System Control in a corrosive atmosphere or any atmosphere containing contaminants.

Shipping. Claim must be filed with carrier.

WARRANTY IS VOID IF:

The ROBERTS GORDON® System Control is not installed by a electrician qualified in the installation of control systems for heating equipment.

You cannot prove original purchase date and required annual maintenance history.

The data plate and/or serial number are removed, defaced, modified or altered in any way.

The ROBERTS GORDON® System Control is transferred. This warranty is nontransferable.

Roberts-Gordon is not permitted to inspect the damaged controller and/or component parts.

READ YOUR OPERATION AND INSTALLATION MANUALS

If you have questions about your ROBERTS GORDON® System Control, contact your installing professional. Should you need replacement parts or have additional questions, call or write Roberts-Gordon:

U.S.A.
1250 William Street
P.O. Box 44
Buffalo, New York 14240-0044
Telephone: 716.852.4400
Fax: 716.852.0854

Canada
241 South Service Road, West
Grimsby, Ontario L3M 1Y7
Telephone: 905.945.5403
Fax: 905.945.0511

On the web at:
www.rg-inc.com

Roberts-Gordon's liability, and your exclusive remedy, under this warranty or any implied warranty (including the implied warranties of merchantability and fitness for a particular purpose) is limited to providing replacement parts during the term of this warranty. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you. There are no rights, warranties or conditions, expressed or implied, statutory or otherwise, other than those contained in this warranty.

Roberts-Gordon shall in no event be responsible for incidental or consequential damages or incur liability for damages in excess of the amount paid by you for the ROBERTS GORDON® System Control. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so this limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction.

Roberts-Gordon shall not be responsible for failure to perform under the terms of this warranty if caused by circumstances out of its control, including but not limited to fire, flood, strike, government or court orders, unavailability of supplies, parts or power. No person is authorized to assume for Roberts-Gordon any other warranty, obligation or liability.

LIMITATIONS ON AUTHORITY OF REPRESENTATIVES:

No representative of Roberts-Gordon, other than an Executive Officer, has authority to change or extend these provisions. Changes or extensions shall be binding only if confirmed in writing by Roberts-Gordon's duly authorized Executive Officer.