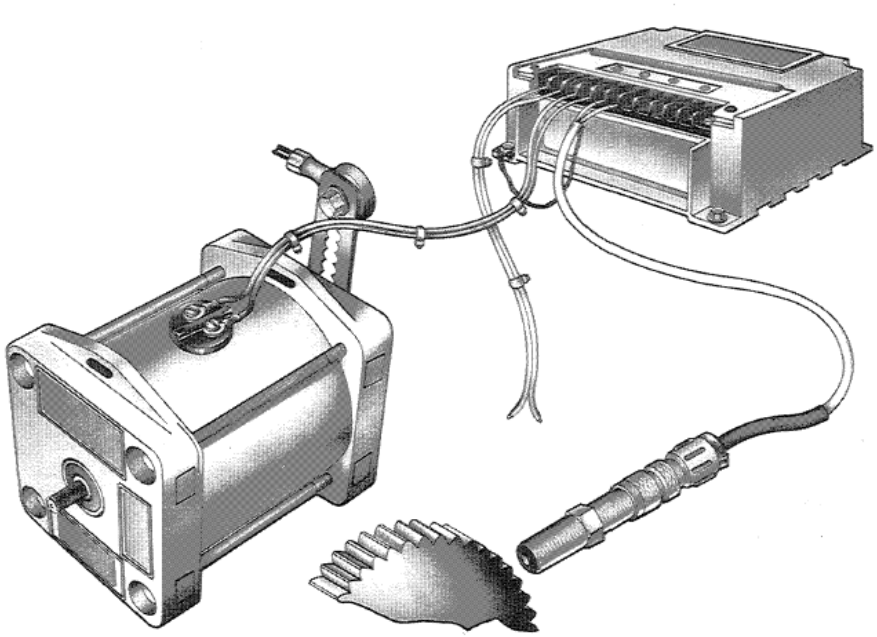
WOODWARD

Manual 25070
(Revision D, 9/2003)
Original Instructions



Electronic Control Installation Guide

Reference Manual

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Warnings and Notices

Important Definitions

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

- **DANGER**—Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING**—Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION**—Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- **NOTICE**—Indicates a hazard that could result in property damage only (including damage to the control).
- **IMPORTANT**—Designates an operating tip or maintenance suggestion.

WARNING

Overspeed / Overtemperature / Overpressure

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.

WARNING

Personal Protective Equipment

The products described in this publication may present risks that could lead to personal injury, loss of life, or property damage. Always wear the appropriate personal protective equipment (PPE) for the job at hand. Equipment that should be considered includes but is not limited to:

- **Eye Protection**
- **Hearing Protection**
- **Hard Hat**
- **Gloves**
- **Safety Boots**
- **Respirator**

Always read the proper Material Safety Data Sheet (MSDS) for any working fluid(s) and comply with recommended safety equipment.

WARNING

Start-up

Be prepared to make an emergency shutdown when starting the engine, turbine, or other type of prime mover, to protect against runaway or overspeed with possible personal injury, loss of life, or property damage.

WARNING

Automotive Applications

On- and off-highway Mobile Applications: Unless Woodward's control functions as the supervisory control, customer should install a system totally independent of the prime mover control system that monitors for supervisory control of engine (and takes appropriate action if supervisory control is lost) to protect against loss of engine control with possible personal injury, loss of life, or property damage.

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NOTICE

Battery Charging Device

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

Electrostatic Discharge Awareness

NOTICE

Electrostatic Precautions

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts:

- **Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).**
- **Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.**
- **Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.**

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual *82715*, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Follow these precautions when working with or near the control.

1. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as much as synthetics.
2. Do not remove the printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:
   - Do not touch any part of the PCB except the edges.
   - Do not touch the electrical conductors, the connectors, or the components with conductive devices or with your hands.
   - When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.

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Control Installation

1. Controls in die cast enclosures are designed to permit engine skid mounting. All others should be protected from direct water contact and not mounted on the engine skid.

2. Adequate ventilation should be available for cooling. Shield controls and wiring from heat sources such as exhaust manifolds and turbochargers.

3. Controls should not be installed near high voltage or high current devices such as switch gear and starter solenoids.

4. Allow enough space for servicing the control.

5. Ambient temperature should be within limits. See the appropriate manual.

6. Tie the control chassis to system ground for proper shield termination and circuit board shielding.

7. Note wire length limitations when mounting.

Wiring

1. Even if currents are low, wire should be 0.3 mm² (22 AWG) or larger for mechanical strength. In most cases wire need not be larger than 0.8 mm² (18 AWG).

2. All connections should be mechanically and electrically secure. Connections made by soldering, crimping, etc., should only be done with the correct tools and procedures.

3. Do not allow sharp bends in the wiring. Keep bends away from objects which could wear through insulation.

4. Do not subject wires, connectors, switches, etc., to temperatures beyond their design limits.

5. Use insulated terminals to connect wires to the control terminal blocks.

6. If the symbol  is shown, twisted, shielded wire should be used. The number of lines through the symbol is the number of wires within the shield. A braided shield is best for protection against power frequencies (50 and 60 Hz). Radio frequency interference is best minimized by a foil shield.

   Connect shields as shown on the plant wiring diagram (some controls require shields to be passed through the control connector and terminated internally). Terminate shields for most controls at a chassis screw. Die cast enclosures have a screw on the front edge for this purpose. For sheet metal controls, use a screw at the side of the terminal block. Only one end (the end nearest the electrical control) of each shield should be tied to ground. All shields are usually tied to the same point.

   When passing shields through connectors and terminal blocks, treat each shield as if it were a signal wire. Each shield must be given its own pin or terminal and be kept insulated from nearby wires and metal conductors. Do not tin (solder) braided shields.

   Connect the control chassis to system ground ( ).

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When using the following controls, the external diode is not necessary because it is already in the controls.

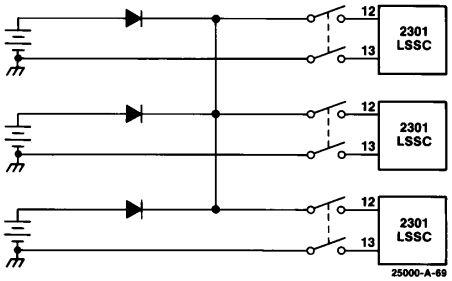


Figure 4. High Voltage Selector, External Diode

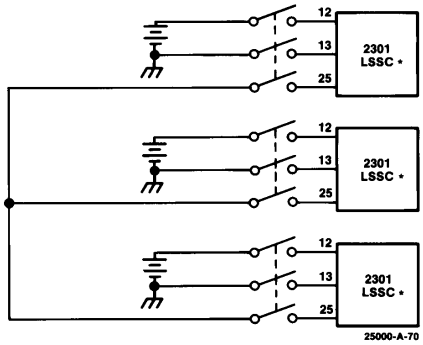


Figure 5. High Voltage Selector, Internal Diode

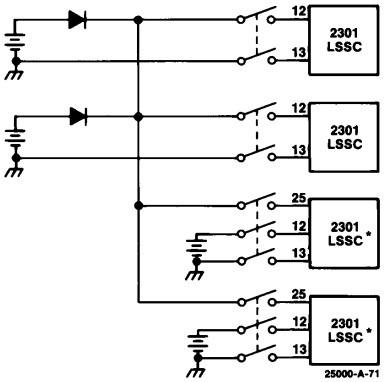


Figure 6. High Voltage Selector, External and Internal Diode

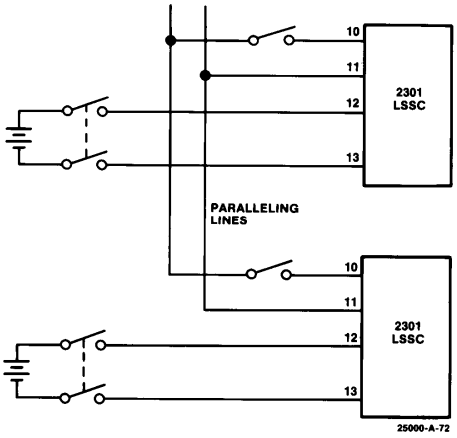


Figure 7. Hardwired Paralleling Line Common

Table 1. Controls with Internal Diodes

8271-422	8271-472	8271-652	8271-706
8271-444	8271-473	8271-676	8271-747
8271-467	8271-542	8271-679*	8290-009

*—8271-679 is used only on gas turbines and has different terminal numbers. Refer to the plant wiring drawing.

These newer controls are also identified by no label at terminal 25, and "20–40 Vdc" at terminals 12 and 13. Older controls (which require external diodes) have "32 Vdc" at terminal 25 and "24 Vdc" at terminals 12 and 13. With the newer controls, the high voltage selector scheme is accomplished by connecting terminals 25 on the individual controls. See Figure 5.

When using this scheme, it is necessary to switch terminal 25 as well as the positive and negative power input.

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PRODUCT: 8271-467 / Woodward 2301 Load Sharing and Speed Control

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