



**Product Manual 82348**  
**(Revision NEW, 1987)**  
Original Instructions

**Pre-regulator**  
**for 2301 and 2301A Controls**

**Installation and Operation Manual**



### General Precautions

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment.

Practice all plant and safety instructions and precautions.

Failure to follow instructions can cause personal injury and/or property damage.



### Revisions

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### Proper Use

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.



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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.

**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.

## Introduction

The 8272-217 Pre-regulator is an optional device designed to supply  $36 \pm 4$  Vdc to 2301 Speed Controls and 2301 or 2301A Load Sharing and Speed Controls. On 2301 controls, it helps eliminate several major causes of control failure.

## Description

The Pre-regulator is designed for use with 2301 Speed Controls or 2301 and 2301A Load Sharing and Speed Controls. It supplies a  $36 \pm 4$  Vdc input when an available power source is between 20 and 45 Vdc. In some instances, a power supply with an output up to 65 Vdc may be used; however, before using such a supply, approval should be obtained from Woodward.

The Pre-regulator protects 2301 controls from up to 150 volt voltage spikes and from reverse polarity damage. The Pre-regulator is fused to protect against current surges. Although similar features are built into the 2301A control, use of the Pre-regulator will enhance the existing features.

## Installation

The Pre-regulator is designed to fit on a 2301 (2301A) mounting flange, and it should be located between the existing mounting studs located opposite the terminal block. Wire size should be of an equal or larger diameter as that of existing wiring (Figure 1).

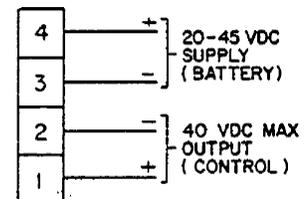


Figure 1. Wiring Diagram

## Troubleshooting

If the host 2301 (2301A) control should fail, inspect the fuse on the Pre-regulator to determine if it is the failure cause. The fuse holder is located at the side of the assembly, and the fuse is accessed by removing (unscrewing) the cap in the end of the fuse holder. When replacing a fuse, use a standard 0.75 A fuse. If a fuse fails, always attempt to determine the cause of failure before placing the control back in service. Two fuses (one for the Pre-regulator and one spare) are supplied with the Pre-regulator.

## Service

Except for fuse replacement, this device is not considered field repairable. If returning the device for service, contact Woodward or your authorized distributor/service facility. State the model number of the 2301/2301A control and the nature of the problem.

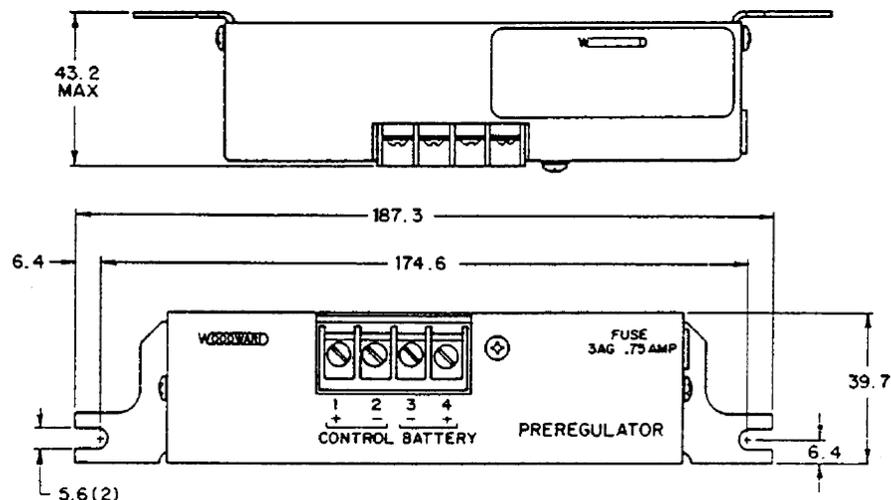


Figure 2. Outline Drawing

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