WOODWARD

Product Manual 85115
(Revision NEW)

Original Instructions

Dual Power Source

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

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, check manual *26311* , *Revision Status & Distribution Restrictions of Woodward Technical Publications*, on the *publications page* of the Woodward website:

www.woodward.com/publications

The latest version of most publications is available on the *publications page*. If your publication is not there, please contact your customer service representative to get the latest copy.

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.

Translated Publications

If the cover of this publication states "Translation of the Original Instructions" please note:

The original source of this publication may have been updated since this translation was made. Be sure to check manual *26311* , *Revision Status & Distribution Restrictions of Woodward Technical Publications*, to verify whether this translation is up to date. Out-of-date translations are marked with ⚠. Always compare with the original for technical specifications and for proper and safe installation and operation procedures.

Revisions—Changes in this publication since the last revision are indicated by a black line alongside the text.

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.

Dual Power Source

Introduction

This manual describes the operation, installation, maintenance, troubleshooting, and replacement of the 8238-017 and 8238-018 Dual Power Sources.

Description

The Dual Power Source uses two input power sources to provide a high reliability power source for Woodward Electronic controls. The output of the Dual Power Source is an unregulated and unfiltered 90 to 150 Vdc.

Two independent power supplies provide input power to the Dual Power Source. The 8238-017 requires two ac input power supplies. The 8238-018 requires one ac input power supply and one dc input power supply (see AC Voltage Ranges for the ac input voltage ranges available). The ac input power supplies are converted to unfiltered dc signals. After the ac input power is converted to dc, the two input power supplies are high signal selected together and the higher signal becomes the output of the Dual Power Source.

Installation

Unpacking

After unpacking the unit, check it for any signs of damage. If any damage is found, notify the shipper immediately.

Location

When selecting a location for mounting the unit, remember that the unit should be protected from direct exposure to water or a condensation-prone environment. Allow a minimum of two inches open space around the sides of the unit and leave enough room at the front of the unit to open the door. Shield the unit from radiant heat sources.

Installation

After selecting a suitable location for the Dual Power Source, locate and drill four 0.45 inch (11.4 mm) mounting holes (see Figure 3) and mount the unit.

AC Voltage Ranges

The Dual Power Source has eight ac voltage ranges available (see Figure 1). The 88 to 132 Vac range is factory set. If a different range is desired, you must change the wiring at the transformer. T1 (transformer 1) is wired to TB 1-4 and TB1-5, and T2 (transformer 2), if used, is wired to TB1-1 and TB1-2. Each transformer has terminal strips mounted on the sides of it.

Transformer terminals 1 through 8 are the transformer primary; transformer terminals 9 through 16 are the transformer secondary. When changing the ac voltage range, perform the following steps:

1. Remove all power to the unit.

2. Remove the wires and jumpers from transformer terminals 1 through 8 of the affected transformer. DO NOT change the wires connected to transformer terminals 9 through 16.

3. Connect the wires and jumpers for the ac voltage range selected in Figure 1.

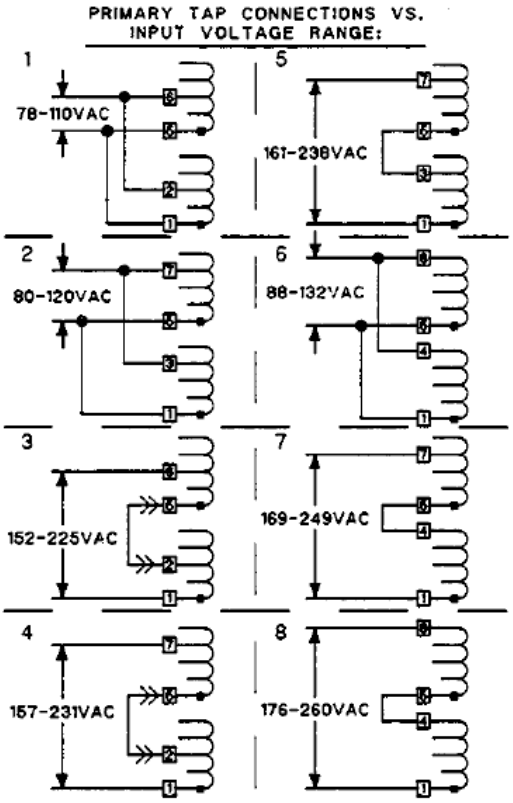

Figure 1. AC Voltage Ranges

Wire Connections

NOTICE

Make sure the input voltages and transformer wiring are correct. The output voltage of the Dual Power Source tracks the highest input power supply. If the input voltage is too high or the transformer wiring is wrong, the Dual Power Source or the unit that is being powered by the Dual Power Source may be damaged. To wire the Dual Power Source, perform the following steps:

1. Make sure there is no power in the external wiring.

2. Route all wiring through the conduit hub.

3. Connect an ac power supply (PS1), set at the correct voltage, to TB1-4 and TB1-5.

4. Turn on PS1 and measure the voltage at TB1-6 (+) and TB1-7 (–). The voltage should be 90 to 150 Vdc. If it isn't, check the input voltage and transformer wiring.

5. Turnoff PS1.

6. If the unit is an 8238-017, connect an ac power supply (set at the correct voltage) to TB1-1 (+) and TB1-2 (–). If the unit is an 8238-018, connect a dc power supply (set at the correct voltage) to TB1-1 (+) and TB1-2 (–). The power supply connected to TB1-1 and TB1-2 will be called PS2.

7. Turn on PS2 and measure the voltage at TB1-6 (+) and TB1-7 (–). The voltage should be 90 to 150 Vdc. If it isn't, check the input voltage and transformer wiring.

8. Turn off PS2.

9. Connect the unit being powered by the Dual Power Source to TB1-6 (+) and TB1-7 (–).

10. Before applying power to the Dual Power Source, compare the wiring to the wiring diagram (Figure 2).

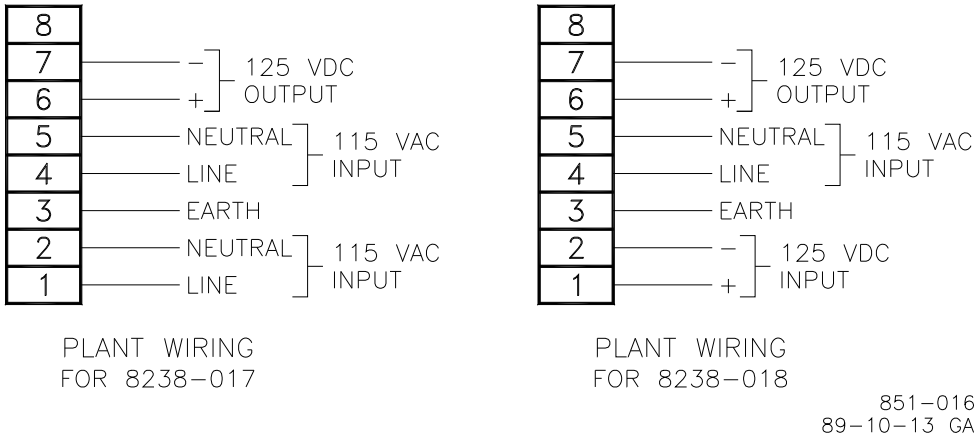

Figure 2. Wiring Diagram

Maintenance

The Dual Power Source is not field serviceable. In the event of a field failure, the unit should be returned to Woodward or your authorized dealer or distributor for repair or replacement (contact information is on the Woodward website, **www.woodward.com**).

Troubleshooting

WARNING

HIGH VOLTAGE—High voltages are present. When performing the following tests, hold all probes by their insulated barrels. Do not touch exposed metal parts.

To determine if the Dual Power Source is operating normally, perform the following steps:

1. Measure the output voltage across TB1-6 (+) and TB1-7 (–). The voltage should be between 90 and 150 Vdc.

2. Measure the input voltage across TB1-4 and TB1-5. The voltage should be between 88 and 132 Vac (unless the transformer wiring has been changed).

3. Measure the input voltage across TB1-1 (+) and TB1-2 (–). If the unit is an 8238-018, the voltage should be between 90 and 150 Vdc. If the unit is an 8238-017, the voltage should be between 88 and 132 Vac (unless the transformer wiring has been changed).

4. If the input voltages are present but the output voltage is out of tolerance, check the wiring of both transformers. If there is no output voltage at all, check the fuses.

Replacement

To replace the Dual Power Source, perform the following steps:

1. Remove all input power to the unit.

2. Label and remove all wires from TB1.

3. Replace the bad unit with a good one.

4. Reconnect all wires to TB1.

5. Apply input power to the new unit.

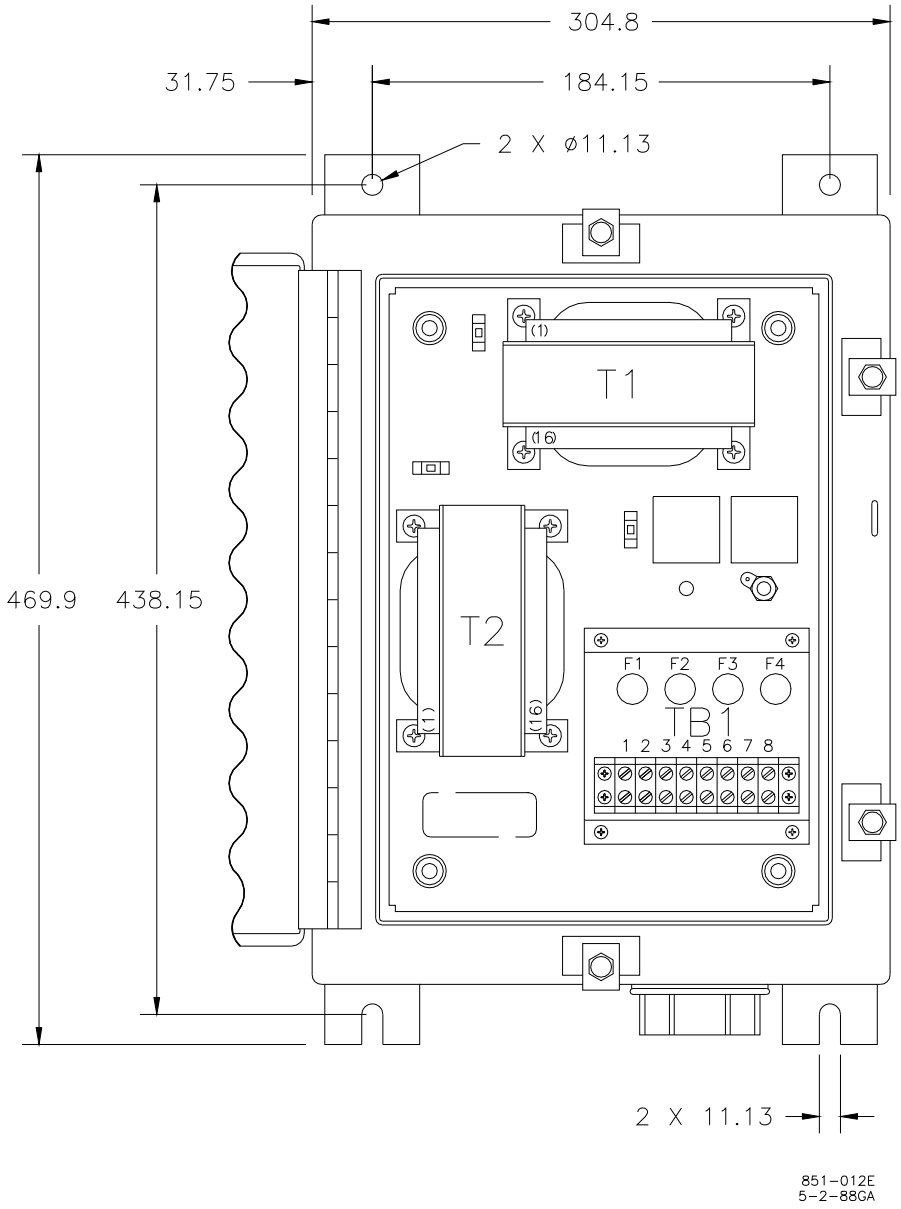

Figure 3. Outline Drawing

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Send comments to: icinfo@woodward.com

Please reference publication 85115.

B85115:NEW

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