Service Manual

Our energy working for you.™

Power Generation

Transfer Switch

RSS100 and RSS200

English – Original Instructions 3–2011 962–0522 (Issue 3)

Table of Contents

SECTION	TITLE	PAGE
	SAFETY PRECAUTIONS	**iii**
1.	**INTRODUCTION**	**1-1**
	About This Manual	1-1
	Introduction	1-2
	Transfer Switch Application	1-2
	Transfer Switch Function	1-2
	Model Identification	1-3
	Transfer Switches With a Controller	1-3
	Transfer Switches Without a Controller	1-4
	How to Obtain Service	1-5
2.	**TROUBLESHOOTING – TRANSFER SWITCHES WITH A CONTROLLER**	**2-1**
	Control Panel LED Indicators	2-1
	Control Panel Functions That Should Not be Adjusted	2-3
	Time Delay Program Transition	2-3
	Time Delay Elevator Signal	2-3
	External Exercise On (Off)	2-3
	System Nominal Voltage	2-3
	System Nominal Frequency 50/60 Hz	2-3
	Single Phase/Three Phase	2-3
	Return to Programmed Transition On/Off	2-3
	Elevator Post Transfer Delay On/Off	2-3
	Accessing the Front Panel Configuration Editor	2-4
	Modifying the Configuration	2-4
	Preliminary Troubleshooting Procedures	2-7
	Power Outage Occurs, But Generator Does Not Start	2-7
	Generator Starts During Normal Power Service	2-7
	Generator Does Not Exercise	2-8
	After a Power Failure, the Generator Starts But Does Not Assume the Load	2-9
	After Power Returns, the Transfer Switch Does Not Return To Normal Position	2-10
	Generator Continues to Run After Retransfer of Load to Normal Power	2-10
	System Does Not Test With Load	2-11
	System Does Not Exercise With Load	2-12
	Battery Charger Fails To Charge	2-12
	Battery Loses Water	2-13
	Battery Loses Charge	2-13

Table of Contents (continued)

SECTION	TITLE	PAGE
	Detailed Troubleshooting Procedures	2-13
	About Customer Inputs	2-13
	Control Panel LED Indicators	2-13
	Sequence of Events	2-15
	Utility to Generator Sequence of Events	2-15
	Generator to Utility Sequence of Events	2-17
	Troubleshooting With Symptoms	2-19
	Transfer Switch Operation	2-19
	Utility Power Failure	2-20
	Utility Power Is Restored	2-23
	Miscellaneous Troubleshooting Issues	2-26
3.	**TROUBLESHOOTING – TRANSFER SWITCHES WITHOUT A CONTROLLER**	**3-1**
	Sequence of Events	3-1
	Utility to Generator Sequence of Events	3-1
	Generator to Utility Sequence of Events	3-3
	Troubleshooting With Symptoms	3-3
	Transfer Switch Operation	3-3
	Troubleshooting	3-3
4.	**TRANSFER SWITCH SERVICE**	**4-1**
	Switch Assembly Removal and Replacement Procedure	4-1
	Limit Switch Replacement Procedure	4-5
	Control Replacement Procedure	4-6
	Battery Charger Replacement Procedure	4-7
	Control Relay Replacement Procedure	4-8
	Circuit Breaker Replacement Procedure	4-9
	Signal Transformer Replacement Procedure	4-10
5.	**PARTS INFORMATION**	**5-1**
6.	**WIRING DIAGRAMS**	**6-1**

Safety Precautions

This manual includes the following symbols to indicate potentially dangerous conditions. Read the manual carefully and know when these conditions exist. Then take the necessary steps to protect personnel and the equipment.

⚠ DANGER ***This symbol warns of immediate hazards that will result in severe personal injury or death.***

⚠WARNING ***This symbol refers to a hazard or unsafe practice that can result in severe personal injury or death.***

⚠ CAUTION ***This symbol refers to a hazard or unsafe practice that can result in personal injury or product or property damage.***

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

High voltage in transfer switch components presents serious shock hazards that can result in severe personal injury or death. Read and follow these suggestions.

Keep the transfer switch cabinet closed and locked. Make sure only authorized personnel have the cabinet keys.

Due to the serious shock hazard from high voltages within the cabinet, all service and adjustments to the transfer switch must be performed only by an electrician or authorized service representative.

UTILITY-TO-GENERATOR APPLICATIONS

If the cabinet must be opened for any reason:

1. Move the operation selector switch on the generator set to Stop.
2. Disconnect the battery charger.
3. Disconnect the starting batteries of the generator set or sets (remove the ground [–] lead first).
4. Remove AC power to the automatic transfer switch. If the instructions require otherwise, use extreme caution due to the danger of shock hazard.

GENERAL PRECAUTIONS

Place rubber insulative mats on dry wood platforms over metal or concrete floors when working on any electrical equipment. Do not wear damp clothing (particularly wet shoes) or allow skin surfaces to be damp when handling any electrical equipment.

Jewelry is a good conductor of electricity and should be removed when working on the electrical equipment.

Wear safety glasses whenever servicing the transfer switch and and do not smoke near the batteries.

Do not work on this equipment when mentally or physically fatigued, or after consuming alcohol or any drug that makes the operation of equipment unsafe.

⚠WARNING

INCORRECT SERVICE OR REPLACEMENT OF PARTS CAN RESULT IN DEATH, SEVERE PERSONAL INJURY, AND/OR EQUIPMENT DAMAGE. SERVICE PERSONNEL MUST BE QUALIFIED TO PERFORM ELECTRICAL AND/OR MECHANICAL SERVICE.

OTEC-1

1. Introduction

ABOUT THIS MANUAL

This manual contains service procedures for RSS transfer switches.

- Section 1 describes the basic operation of a transfer switch and provides information on model identification and how to obtain service.
- Section 2 provides information on how to troubleshoot transfer switches that include a controller (see Figure 1-1).

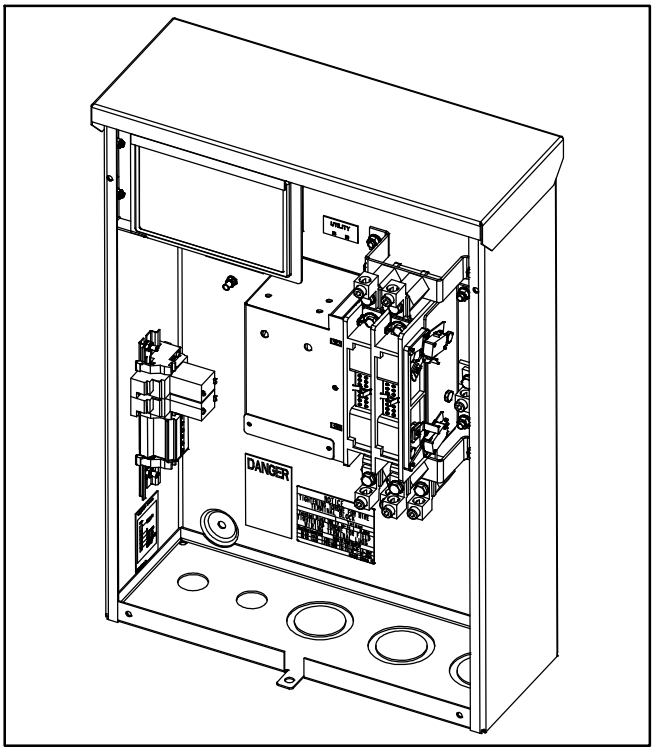

FIGURE 1-1. RSS TRANSFER SWITCH WITH CONTROLLER (WITH DOOR PANEL REMOVED)

- Section 3 provides information on how to troubleshoot transfer switches that include a circuit breaker but do not include a controller (see Figure 1-2).
- Section 4 provides information on servicing the transfer switch.
- Section 5 includes parts information.
- Section 6 includes transfer switch wiring diagrams.

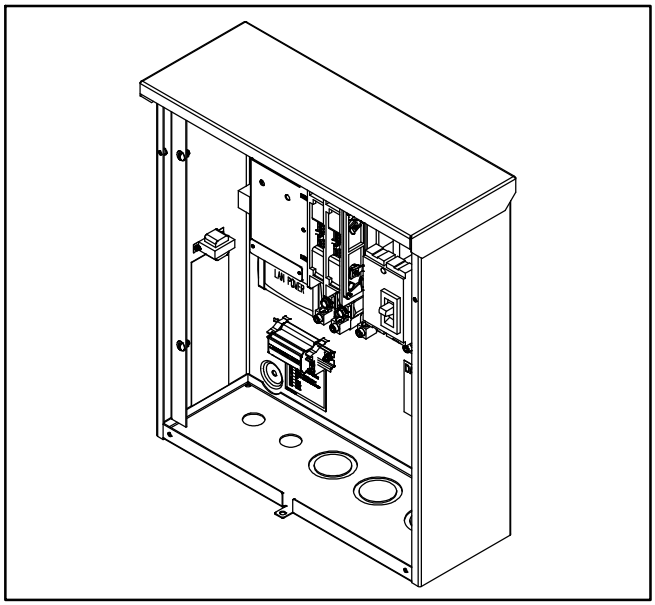

FIGURE 1-2. RSS TRANSFER SWITCH WITHOUT CONTROLLER – ONE BREAKER WITH DOOR PANELS REMOVED

INTRODUCTION

This is an open transition transfer switch. With an open transition switch, there is never a time when both sources are supplying power to the load. This manual includes information on the following types of RSS transfer switch installations.

- RSS with Controller – The RSS transfer switch with an Automatic Transfer Switch (ATS) control includes an operator panel located behind the hinged panel in the upper left hand corner on the front of the enclosure. Access to the control can be obtained by removing the controller cover screw. The door panel must be removed to gain access to transfer switch components.

- RSS without Controller (One Circuit Breaker) – Access to the circuit breaker can be obtained by removing the outer door panel. An internal panel must be removed to gain access to transfer switch components.

Refer to the wiring diagrams at the end of this manual for specific information about switch configuration.

Use normal and necessary safety precautions before starting any service procedure. Identify all hazards by referring to the Safety Precautions portion of this manual and by observing all warnings and cautions within the manual. Whenever you are troubleshooting, remember that the generator set, the transfer switch, and the utility power source are all interdependent.

TRANSFER SWITCH APPLICATION

Transfer switches are an essential part of a building's standby or emergency power system. The utility line (normal power), is backed up by a generator (emergency power). The transfer switch automatically switches the electrical load from one source to the other.

The load is connected to the common of the transfer switch (Figure 1-1). Under normal conditions, the load is supplied with power from the utility (as illustrated). If utility power is interrupted, the load is transferred to the generator. When utility power returns, the load is retransferred to the utility. The transfer and retransfer of the load are the two most basic functions of a transfer switch.

TRANSFER SWITCH FUNCTION

Automatic transfer switches, capable of automatic operation without operator intervention, perform the basic function of transferring the load to the available power source. The controller monitors each source for allowable voltage and frequency range.

This automatic transfer switch, capable of automatic operation without operator intervention, is designed for utility-to-generator applications. In utility-to-generator applications, the transfer switch performs the following functions:

1. Senses the interruption of utility power.
2. Sends a start signal to the generator.
3. Senses the generator is available.
4. Transfers the load to the generator.
5. Senses the return of utility power.
6. Retransfers the load to the utility.
7. Sends a stop signal to the generator.

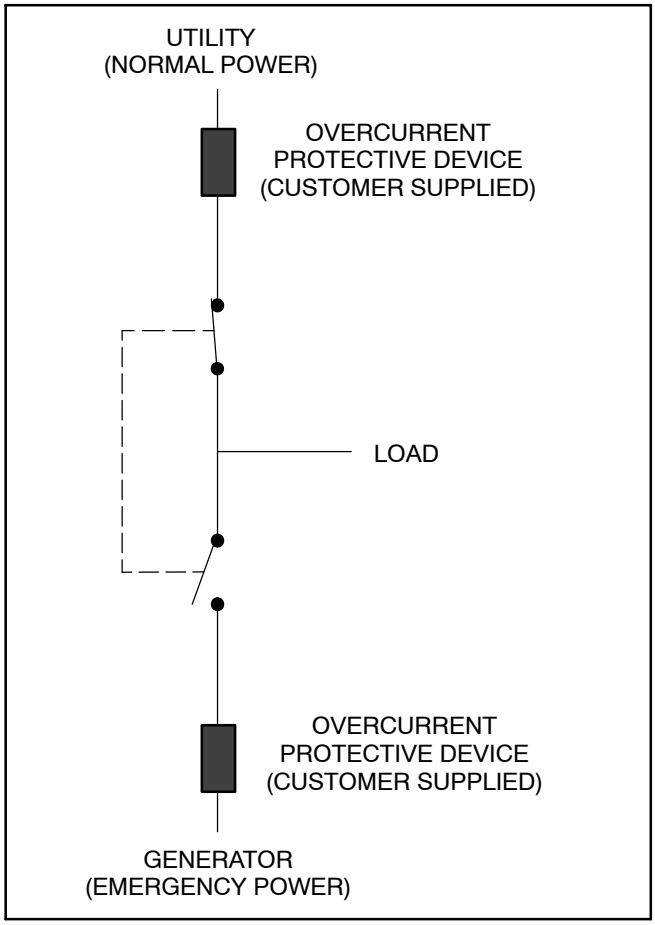

FIGURE 1-3. LOAD TRANSFER SWITCH (TYPICAL FUNCTION)